2 Tax revenue effects of Pillar One

2.1. Introduction

53.   This chapter presents the analytical framework and data sources used by the OECD Secretariat to assess the effect on corporate tax revenues of Pillar One. It focuses exclusively on the effect of Amount A described in the Pillar One Blueprint report (OECD, 2020[1]). The impacts of Amount B and of the processes to improve tax certainty are not modelled due to limitations of the available data, as further discussed below.

54.   A number of design elements and parameters of Pillar One will be the subject of future decisions by the Inclusive Framework. The analytical framework presented in this chapter aims to be sufficiently flexible to explore the implications of a range of design and parameter options. The options considered in this chapter are only illustrative examples and should not be seen as prejudging any final decisions to be taken by the Inclusive Framework.

55.   The framework presented in this chapter has a wide geographic coverage, spanning more than 200 jurisdictions, reflecting the global nature of the proposals and the wide membership of the Inclusive Framework. To enable this wide coverage, the framework combines a variety of micro- and macro-level data sources into a consistent structure, including a set of matrices that are described in Chapter 5. The framework relies as much as possible on micro-data, and uses among other sources an extensive dataset of the financial accounts of more than 27,000 multinational enterprise (MNE) groups from different sources (ORBIS, Worldscope, etc.), including all major highly-digitalised firms. Extensive benchmarking has been undertaken to ensure consistency across the data sources used in the analysis.

56.   While the framework is building on the best data sources available to the OECD Secretariat, it is nevertheless subject to a number of important data and modelling caveats:

- The analysis only focuses on Amount A of Pillar One, leaving aside the potential effects of Amount B and of the improved tax certainty processes through innovative dispute prevention and dispute resolution mechanisms (Tax certainty component), which are difficult to assess due to limitations of the data available to the OECD Secretariat as well as methodological challenges.
    - More specifically, modelling Amount B would require a comprehensive cross-country dataset of entity level data combining information on (i) the nature of the activities of each entity (to identify entities performing baseline distribution and marketing functions that would be in scope of Amount B) and (ii) their financial information (to quantify the effect of applying Amount B). A qualitative assessment suggests that Amount B could reduce administration costs for governments and increase tax certainty for taxpayers, and may be of particular benefit to jurisdictions with low administrative capacity. Where the fixed return for baseline and marketing functions exceeds current returns taxable in market jurisdictions, Amount B would contribute to additional revenues in those jurisdictions. A number of jurisdictions with low administrative capacity assess that this is likely to be the case in their jurisdiction, as a result of the challenges they face applying the existing transfer pricing rules effectively. However, at the global level, the revenue effect of Amount B is likely to be modest, as it does not provide market jurisdictions

with a new taxing right, but is merely designed to simplify the administration of the current transfer pricing system.

  o Modelling the tax revenue implications of the Tax certainty component in Pillar One (the scope of which remains subject to future decisions by the Inclusive Framework) poses methodological challenges, reflecting that this component is of a 'non-numerical' nature, in contrast with Amounts A and B, which means that it does not naturally lend itself to numerical quantification.

- The estimates do not assume that Pillar One would operate under a 'safe harbour' regime as was proposed by the United States in December 2019.

- The data underlying the analysis have limitations in terms of coverage, consistency and timeliness. Most prominently, data on MNEs' profit and its location relates to years 2016 and 2017. As a result, they pre-date significant recent developments, including the implementation of various measures under the OECD/G20 BEPS project,[1] the introduction of the US Tax Cuts and Jobs Act (TCJA) and, more recently, the COVID-19 crisis.

- The analysis relies on a number of simplifying assumptions about the design of Amount A, reflecting the challenges involved in modelling certain potential provisions of Amount A (e.g. foreign in-scope revenue threshold, business line segmentation, loss carry-forward mechanism, marketing and distribution profits safe harbour) with the available data. These simplifying assumptions on the design of Amount A could have an effect on the estimates. For example, the effect of a potential loss carry-forward mechanism is likely to be moderate in 'normal' times, but could be more significant in the aftermath of the COVID-19 crisis as some MNEs may experience substantial losses during the crisis.

- The analysis also relies on simplifications in the modelling of the effect of Pillar One, which is unavoidable given the lack of an exhaustive source of micro-level data covering MNE entities in all jurisdictions in the world. In particular, the reliance on aggregate data in certain parts of the analysis and for certain jurisdictions implies that some firm-level heterogeneities are overlooked, which could affect the results.

- The framework to assess the effect of Pillar One is 'static', in the sense that it does not take into account the effect of potential strategic reactions by MNEs and governments. This contrasts with the OECD Secretariat's revenue estimates for Pillar Two, where some behavioural reactions have been modelled in a stylised way (see Chapter 3). The reason for this difference is that behavioural reactions are likely to be more significant for Pillar Two than for Pillar One.

- The potential interaction between Pillar One and Pillar Two is not taken into account in the Pillar One estimates presented in this chapter. The interaction is modelled in the Pillar Two estimates presented in Chapter 3. The revenue effect of the interaction between Pillar One and Pillar Two is estimated to be relatively small as a share of the overall effect of the proposals.

57.   Given these caveats, the estimates presented in this chapter should be interpreted as illustrating the broad order of magnitude of the impacts of Pillar One, rather than being precise point estimates. Consistent with this, revenue estimates are presented as ranges to reflect the data-related uncertainty around the estimates.


2.2. Overall approach to assess the revenue effects of Pillar One

58.   The analysis of Pillar One in this chapter focuses exclusively on Amount A, as described in the Pillar One Blueprint report (OECD, 2020[1]). Amount A would give market jurisdictions a new taxing right over certain in-scope MNE groups with revenue above an agreed threshold. Although political decisions on the scope of Amount A have not yet been made, the analysis in this chapter has proceeded on the basis of the technical proposals to define the in-scope activities as Automated Digital Services (ADS) and Consumer Facing Businesses (CFB). Amount A would be calculated on an MNE group or segment basis

using a formula. This formula would determine a portion of the residual profit of a group or segment, defined as profit in excess of a profitability threshold that would then be apportioned between eligible market jurisdictions based on revenue. It is envisaged that this profitability threshold would be an agreed ratio of profit before tax (PBT) to turnover. Market jurisdictions would be eligible for Amount A where an MNE group meets the new nexus rules, rules that would not be dependent on the MNE group having a physical presence in a jurisdiction. Finally, to ensure that Amount A does not give rise to double taxation, it would involve a mechanism to effectively determine which jurisdiction or jurisdictions need to relieve the double taxation arising from Amount A.

59.   The main steps of the approach to quantify the tax revenue effects of Pillar One are summarised in the simplified formula in Figure 2.1 and detailed in the following sections of this chapter. The approach first focuses on assessing the global residual profit of the MNE groups that would be in scope, based on an extensive dataset of consolidated financial accounts of MNE groups from the ORBIS database complemented with other sources, such as the Worldscope database (component A of the formula). This step is carried out using a variety of illustrative global revenue and profitability thresholds, focusing only on MNE groups with a primary activity in ADS or CFB. A certain percentage of residual profit (i.e. the reallocation percentage), to be defined by the Inclusive Framework, is then assumed to be reallocated to market jurisdictions (component B). Taken together, components A and B represent the total amount of global residual profit that would be reallocated to market jurisdictions under Amount A. These components are 'global' numbers focusing on all MNE groups worldwide, while the components inside the parentheses of the formula (components C to F) are jurisdiction-specific.

Figure 2.1. Simplified formula summarising the approach on Pillar One (Amount A)
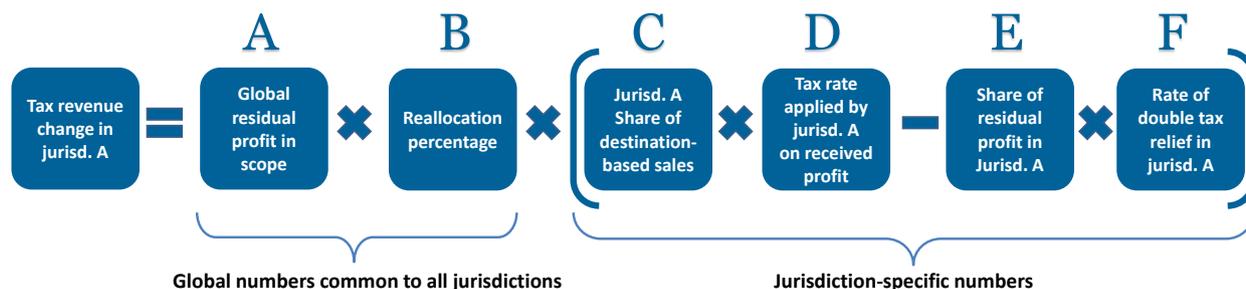
Source: OECD Secretariat.

60.   Components C and D relate to the tax revenue a jurisdiction receives as a result of the reallocation of a percentage of the residual profit, and the components E and F relate to the tax revenue that it gives away in the reallocation. In both cases, the tax revenue impact is the product of a tax base effect (A*B*C and A*B*E) and the tax rate applied to it (D and F).

61.   On the receiving side (components C and D), it is assumed that a jurisdiction is allocated residual profit in proportion to the share of the global sales of the MNE groups in scope that take place in its jurisdiction (as a share of global MNE sales). For internal consistency, all MNE groups in scope (including those that do not sell in the jurisdiction) are considered in the denominator (i.e. the global sales of MNEs) since all MNE groups in scope are also included in component A of the formula. The computation of component C is based on a proxy measure of MNE destination-based sales relying on (i) data from the OECD Analytical Activity of Multinational Enterprises (Analytical AMNE) database (for the location of CFB sales) and (ii) World Bank data on the number of internet users, and United Nations data on average consumption per person (for the location of ADS sales or users), as further described below. Component C takes into account the potential application of a revenue nexus test. Under such a test, no taxing rights

would be allocated to a jurisdiction under Amount A in respect of an MNE group if the revenues of this MNE group derived from that jurisdiction fall below a certain nexus threshold that would be defined by the Inclusive Framework. Several potential levels of the nexus revenue threshold are illustratively modelled, including a situation without a threshold. Finally, the tax rate applied to residual profit received as a result of any reallocation is assumed to be the statutory corporate income tax (CIT) rate (component D).

62.   On the relieving side (components E and F), it is assumed that a jurisdiction would provide 'double tax relief' in proportion to the share of global residual profit currently booked in the jurisdiction. This is a simplifying assumption as the approach to identify the entities providing double tax relief has not yet been agreed by the Inclusive Framework and could potentially be more complex (e.g. by taking into account the nature of the activities of entities and the extent to which they have contributed to the generation of residual profit). The share of residual profit located in each jurisdiction (component E) is assessed based on the 'profit matrix', which combines in a consistent framework a range of data sources, including aggregated and anonymised data from Country-by-Country Reports (CbCRs), firm-level unconsolidated account data from the ORBIS database, and extrapolations based on macroeconomic data, including foreign direct investment (FDI) data. It also relies on a 'turnover matrix', which has been developed using the same approach. Both matrices are described in more detail in Chapter 5. For the ADS sector, data from the US Bureau of Economic Analysis (BEA) on the location of profit of US MNEs are also used. The tax rate on relieved profit (component F), i.e. the rate of double tax relief, which determines the gross tax revenue loss of a jurisdiction, is assumed to be in a range between the statutory CIT rate and a lower rate. As further discussed below, the use of a range reflects that the effective tax rate currently applicable to an MNE's income in a jurisdiction and/or the amount of tax relief to be provided by that jurisdiction may be lower than the statutory CIT rate.

63.   The formula in Figure 2.1 is simplified, in the sense that it does not take into account certain firm-level heterogeneities in the estimation of revenue effects at the jurisdiction level. For example, if all MNE groups having sales (or users) in a given jurisdiction have relatively high levels of global profitability, this jurisdiction will be allocated more residual profit under Amount A than if these MNE groups are relatively less profitable. This is not taken into account in the formula in Figure 2.1, which allocates residual profit to jurisdictions based on their average share in global MNE sales, regardless of the profitability of the specific MNE groups selling in the jurisdiction. A more precise approach would require entity-level data on MNE sales (or users) across all jurisdictions, which are not available to the OECD Secretariat. This simplifying assumption may significantly affect estimated revenue effects at the level of individual jurisdictions, but is unlikely to have a large effect on results at the global level or for wide groups of jurisdictions, since the approximations involved are likely to offset each other at least to some extent (e.g. if highly-profitable MNE groups sell relatively more in a given jurisdiction, they will sell relatively less in other jurisdictions compared to the average MNE group).

2.3.   Component A: Global residual profit in scope

64.   The global residual profit of MNE groups is computed as profit in excess of a certain profitability threshold percentage. The measure of profitability considered is profit before tax (PBT) divided by turnover, as measured in the consolidated financial accounts of the MNE group. For example, if an MNE group has a consolidated PBT to turnover ratio of 15% and the profitability threshold percentage is 10%, then a third of the profit of the MNE group is deemed to be residual profit. While a share of this residual profit will be subject to reallocation to market jurisdictions, it is assumed that no reallocation takes place in situations where an MNE group's profitability is below the threshold.[2]

65.   As further discussed below, the assessment of global residual profit in scope is based on an extensive dataset of MNE group consolidated financial accounts, and a detailed assessment of which MNE groups would be in scope, based on the level of their global revenues (above or below a potential global

revenue threshold) and the nature of their activities (ADS, CFB or out of scope). An important caveat is that this assessment classifies each MNE group based only on its primary business activity, and does not take into account the potential implications of business line segmentation, for example if some activities of an MNE group are in scope while others are out of scope. This leads at the same time to some underestimation of global residual profit (as some MNE groups are excluded while they have some secondary activities in scope) and some overestimation of it (as some MNE groups are fully included while they have some activities out of scope). While it is not possible to quantify the implications of these two sources of inaccuracy, they can be expected to offset each other at least to some extent.

2.3.1. The dataset of MNE consolidated financial accounts

66.   The starting point for the analysis on global residual profit is an extensive dataset of the consolidated financial accounts of MNE groups (see Annex 2.A for a detailed description of the dataset). This dataset builds primarily on consolidated accounts from the ORBIS database. Indeed, the coverage of consolidated account data in ORBIS is generally good across countries, in contrast with unconsolidated account data, for which certain countries have weak coverage (e.g. the United States) (Tørsløv, Wier and Zucman, 2018[2]). In particular, ORBIS contains data on both listed and non-listed firms.

67.   To further enhance coverage, ORBIS data has been complemented with (i) data from the Worldscope database, which contains the financial accounts of (mainly listed) firms worldwide, (ii) data from the EU Industrial R&D Investment Scoreboard, which covers the 2,500 companies with the highest level of R&D spending worldwide (Hernández et al., 2017[3]), and (iii) data from the Fortune Global 500 list (i.e. 500 firms with the highest turnover globally).

68.   Extensive checks have been performed on the dataset to ensure data reliability, building on the ORBIS data expertise accumulated by the OECD Secretariat over the course of a wide range of projects. In particular, financial accounts have been cleaned with procedures in the spirit of Gal (2013[4]) and Johansson et al. (2017[5]) to identify and remove implausible values. Ownership information has been cleaned with procedures following Bajgar et al. (2019[6]) to identify missing or incorrect ownership links.

69.   The final dataset of consolidated MNE group accounts comprises more than 27,000 MNE groups (Table 2.1). This dataset focuses on the whole economy and is therefore much wider than the set of MNEs that would meet the conditions to be in the envisaged scope of Pillar One, which involve having a global turnover and profitability rate above certain thresholds and activities in ADS and CFB. A comparison of the total turnover of MNEs in the sample with macro-level estimates suggests that data coverage is extensive. The combined turnover of MNE groups in the dataset is USD 51.5 trillion, which is close to the estimate of the global production of MNEs in the OECD Analytical AMNE database (USD 52.9 trillion), suggesting that the universe of MNE groups of a significant size is very well covered.[3] In addition, extensive manual checks have been undertaken to ensure that large MNE groups are adequately covered, including major digital-oriented MNE groups.

Table 2.1. Dataset of MNE groups consolidated financial accounts (all sectors)

Number of MNE groups and aggregate financial variables (USD trillion)

	Number of MNE groups	Turnover	Tangible fixed assets	Total assets	EBIT	PBT
Total in the dataset	**27 667**	**51.5**	**21.6**	**170.2**	**4.8**	**4.1**
Of which data from:						
ORBIS	26 704	41.5	20.1	87.2	3.5	3.0
Worldscope	888	6.6	1.4	79.7	1.1	0.9
Other sources (EU R&D scoreboard, Fortune Global 500 and manual additions)	75	3.5	0.05	3.3	0.2	0.2

Note: The sample presented in this table focuses on the whole economy (combining ADS, CFB and out of scope activities) and does not take into consideration the application of a potential global revenue threshold. The total assets of MNE groups from Worldscope tend to be relatively high compared to other sources, which relates to the fact that many MNE groups from Worldscope are large financial firms with extensive financial assets. EBIT stands for earnings before interest and taxes. PBT stands for profit before tax.
Source: OECD Secretariat.

2.3.2. Identifying MNE groups in scope of Pillar One

70.   Although political decisions on the scope of Pillar One have not yet been made, for present purposes the identification of whether a given MNE group would be in scope of Pillar One takes into account the application of a potential global revenue threshold, as well as the nature of the group's activities (ADS, CFB or out of scope). Regarding the global revenue threshold, a variety of potential thresholds are considered, and only MNE groups with global revenues above the considered threshold are assumed to be in scope. The lack of segmented data on both a business line and geographic basis means it has not be possible to model the impact of a potential threshold for in-scope revenues, nor of a potential 'domestic business exemption' (e.g. an exception for MNEs generating almost all their revenues from their domestic market).

71.   The classification of MNE groups as ADS, CFB or out of scope is based on the proposed definitions of ADS and CFB outlined in the Pillar One Blueprint report (OECD, 2020[1]). ADS is defined by recognising that "certain MNEs generate revenue from the provision of automated digital services (including revenue from the monetisation of data) that are provided on an automated and standardised basis to a large and global customer or user base and can do so remotely to customers in markets with little or no local infrastructure". The general definition of ADS is "built on two elements: (i) automated, i.e. once the system is set up the provision of the service to a particular user requires minimal human involvement on the part of the service provider; and (ii) digital, i.e. provided over the Internet or an electronic network". In particular, ADS would cover activities in a non-exhaustive "positive list" including "online advertising services; sale or other alienation of user data; online search engines; social media platforms; online intermediation platforms; digital content services; online gaming; standardised online teaching services; and cloud computing services."

72.   In turn, CFB is defined as covering "businesses that generate revenue from the sale of goods and services of a type commonly sold to consumers, including those selling indirectly through intermediaries and by way of franchising and licensing."

73.   Though considerable technical work has been carried out on how ADS and CFB could be defined, as outlined in the Pillar One Blueprint report, no political agreement has been reached to date on the use of these categories and their exact boundaries. Reflecting this, the classification used in this chapter should only be considered as illustrative and not prejudging the final decisions to be made by the Inclusive Framework. In addition, as discussed below, the identification of ADS and CFB in this chapter relies on

existing classifications of activities (e.g. industrial classification of economic activities) which were not designed for the purpose of identifying ADS and CFB, which may lead to some approximations (e.g. because certain categories may contain a mix of ADS, CFB and out-of-scope activities).

74.   The classification of MNE groups in this chapter, based on their primary business activity, is done in three steps:

- **Step 1: By using the UNCTAD list of the top digital and ICT MNEs** (UNCTAD, 2017[7]). The UNCTAD list classifies 200 digital oriented MNE groups into 14 categories (e.g. search engines, social networks, IT devices). The classification of these categories as ADS, CFB or out of scope, based on the Inclusive Framework proposed definition of ADS and CFB, is presented in Table 2.2, Panel A. The financial data from the MNE groups in the UNCTAD list is retrieved from the financial account dataset described in the previous section, in which these groups are identified manually based on their name.

- **Step 2: By applying a detailed industrial classification**. For MNE groups not included in the UNCTAD list (i.e. non digital oriented groups, as well as relatively small digital oriented groups), the classification relies on the NACE Rev. 2 nomenclature of economic activities, at the 4-digit level (Eurostat, 2008[8]). This nomenclature comprises 615 categories, which are classified as ADS, CFB or out of scope in the way presented in Table 2.2, Panel B. Information on the primary activity of the MNE groups in the dataset with respect to this nomenclature is sourced from the ORBIS database.

- **Step 3: By carrying out manual checks of the largest and most profitable MNE groups**. The aim of these manual checks is to ensure that the MNE groups with the highest levels of residual profit, and therefore the largest potential impact on the results, are properly classified. They also aim to address the issue arising from the fact that certain categories in the UNCTAD and NACE Rev. 2 classifications may contain a mix of in-scope and out-of-scope activities.[4] These manual checks are based on a variety of information sources including company websites, company annual reports, newspaper articles and other credible online sources. The extent of these checks has been extensive, including the top-500 largest MNE groups (by turnover), the top-100 MNE groups with the highest residual profit, the top-25 ADS MNE groups with the highest residual profit, and the top 3 MNE groups with highest residual profit in each industry (30 industries, based on the NACE Rev. 2 classification). Overall, these manual checks have confirmed the classification based on the two steps above for most MNE groups, and led to the reclassification of only a few MNE groups.

Table 2.2. Identification of ADS and CFB activities

Panel A: Classification based on the UNCTAD list			
	ADS	**CFB**	**Out of scope**
Category in the UNCTAD list	Search engines Social networks Other platforms Other e-commerce Games IT software and services	Internet retailers Digital media IT devices Telecom	Components Electronic payments Other digital solutions Info and data

Panel B: Classification based on the industrial classification (NACE Rev. 2, at the 4-digit level)

	ADS	CFB	Out of scope
Category in the NACE Rev. 2 classification	58.2, 62.03, 62.09, 63.1	10.4, 10.5, 10.6, 10.7, 10.8, 10.92, 11, 12, 14, 15, 17.22, 18, 20.4, 21, 25.7, 26.2, 26.3, 26.4, 26.52, 26.7, 27.5, 27.9, 29.1, 30.9, 31, 32.12, 32.13, 32.2, 32.3, 32.4, 32.9, 35.13, 35.22, 35.3, 36, 37, 38.1, 45.1, 45.2, 45.32, 45.4, 47, 49.1, 49.3, 50.3, 53, 55, 56, 58.1, 59, 60, 61, 63.9, 77.11, 77.2, 79, P, Q, R, 95, 96, T	A, B, 10.1, 10.2, 10.3, 10.91, 13, 16, 17.1, 17.21, 17.23, 17.24, 17.29, 19, 20.1, 20.2, 20.3, 20.5, 20.6, 22, 23, 24, 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.9, 26.1, 26.51, 26.6, 26.8, 27.1, 27.2, 27.3, 27.4, 28, 29.2, 29.3, 30.1, 30.2, 30.3, 30.4, 32.11, 32.5, 33, 35.11, 35.12, 35.14, 35.21, 35.23, 38.2, 38.3, 39, F, 45.31, 46, 49.2, 49.4, 49.5, 50.1, 50.2, 50.4, 51, 52, 62.01, 62.02, K, L, M, 77.12, 77.3, 77.4, 78, 80, 81, 82, O, 94, U

Note: The categories are identified as ADS, CFB or out of scope based on the proposed definition of ADS and CFB in the Pillar One Blueprint report (OECD, 2020[1]). This classification should be seen as nothing more than illustrative, given that no political agreement has been reached to date on the use of these categories and their exact boundaries. In addition, certain categories in the table may contain a mix of ADS, CFB and out of scope activities. The UNCTAD categories are taken from a classification of the top-100 digital and top-100 ICT MNEs (UNCTAD, 2017[7]). The industrial classification is NACE Rev. 2 at the 4 digit level (Eurostat, 2008[8]). This classification contains 615 categories (called 'classes'). The information in this table is presented at the level of classes, or at a higher level of aggregation ('divisions' or 'groups') when all classes in a division or a group are in the same category (ADS, CFB or out of scope).
Source: OECD Secretariat.

2.3.3. Estimates of global residual profit

75.   Based on the data presented in the previous sections, it is possible to compute the amount of global residual profit in scope of Amount A of Pillar One for a variety of global revenue and profitability thresholds. The results for an illustrative set of thresholds are presented in Table 2.3.

76.   One insight from these results is that the amount of global residual profit declines only relatively slowly when higher global revenue thresholds are considered, reflecting that an important share of residual profit is concentrated among relatively large MNE groups (Panel A). In contrast, the amount of global residual profit in scope declines relatively rapidly when higher profitability thresholds are considered (Panel B).

2.3.4. Developments of global residual profit over time and impact of COVID-19 crisis

77.   The results in Table 2.3 are based on underlying data focusing on year 2016, reflecting the lack of availability of a more timely set of comprehensive firm-level data at the time of this analysis. As a result, the estimates in Table 2.3 do not take into account recent and ongoing developments that can affect the amount of residual profit in ADS and CFB activities, such as the trend towards digitalisation of the economy and the implications of the COVID-19 crisis. While the general conclusions above on the sensitivity of global residual profit to the Pillar One parameters considered can be expected to remain valid, the overall amount of global residual profit is likely to have evolved in recent years and to continue evolving in the future.

Table 2.3. Global residual profit for a variety of thresholds

Panel A: Global residual profit for a range of global revenue thresholds

Global revenue threshold	Global residual profit in scope (in USD billion)					
	ADS		CFB		Total (ADS + CFB)	
	10% profitability threshold	20% profitability threshold	10% profitability threshold	20% profitability threshold	**10% profitability threshold**	**20% profitability threshold**
No threshold	83	38	433	145	**516**	**183**
EUR 100m	83	37	430	144	**513**	**181**
EUR 300m	82	37	424	142	**506**	**179**
EUR 500m	81	37	417	139	**498**	**176**
EUR 750m	81	37	413	138	**493**	**174**
EUR 1bn	80	36	407	135	**487**	**171**
EUR 2bn	78	36	388	129	**466**	**165**
EUR 5bn	74	35	341	112	**415**	**147**

Panel B: Global residual profit for a range of profitability thresholds

Profitability threshold	**Global residual profit in scope (USD billion)**, assuming a EUR 750m global revenue threshold		
	ADS	CFB	Total
8%	90	513	**604**
10%	81	413	**493**
15%	58	230	**288**
20%	37	138	**174**
25%	18	85	**103**

Note: Panel A explores the implication of different global revenue thresholds for two potential profitability thresholds (10% and 20%). Panel B explores the implications of a wider variety of profitability thresholds while assuming a EUR 750 million global revenue threshold. Global revenue thresholds are defined in EUR (while most other data in the analysis are in USD) for comparability with the revenue threshold for country-by-country reporting, which is defined in EUR. The data underlying the estimates in both panels focus on year 2016. Residual profit is computed as profit in excess of a certain profitability threshold percentage, which is defined as profit before tax (PBT) to turnover, based on the consolidated financial accounts of the MNE group considered. In both panels, only MNE groups with a primary activity in ADS and CFB sectors are included. The fact that MNE groups may have different business lines or units operating in different sectors is not taken into account.
Source: OECD Secretariat.

78.   In particular, the longstanding trend towards digitalisation of the economy is likely to lead to further rapid increases in demand for ADS. This could translate into higher levels of residual profit in ADS, especially given the fact that markets for certain digital activities (e.g. online advertising) are concentrated among a few global players with low marginal costs and relatively high profitability rates, due notably to

the winner-takes-most nature of certain digital activities involving strong network effects. In such markets, growth in consumer demand seems more likely to translate into higher residual profit than in markets with higher marginal costs and lower concentration. Reflecting these trends, a simple analysis focusing on the (manually retrieved) financial accounts of the top-10 MNEs with the highest levels of residual profit in 2016 among MNEs with a primary activity in the ADS sector suggests that their residual profit has increased by 30% on average between 2016 and 2019.

79.   The impact of the COVID-19 crisis on global residual profit is more difficult to anticipate at this stage as the crisis is still unfolding and the data available for analysis is very limited. For many MNEs in the CFB sector, the crisis is likely to have a strong negative impact on profitability at least in the short to medium term, reflecting the negative impact of the crisis on consumer demand as well as potential difficulties with production (e.g. locked-down workers, supply chain disruptions, restrictions on travel). The longer term effect of the crisis on profitability among MNEs in the CFB sector will depend on the shape of the economic recovery, as well as potential structural changes to the economy that the crisis may bring or accelerate (e.g. changes in the sectoral structure of economies, the structure of global value chains and competition dynamics among firms). Among MNEs in the ADS sector, the impact of the COVID-19 crisis has been heterogeneous, but overall it seems at this stage to have been less negative than in CFB. While certain ADS activities have been hit hard by the crisis (e.g. ride hailing and accommodation sharing platforms) or at least moderately affected (e.g. online advertising), others have tended to benefit from increased demand (e.g. cloud computing, video streaming, video conferencing facilities, online marketplaces). Overall, notwithstanding the high degree of uncertainty about the impact of the COVID-19 crisis, the developments so far suggest that the crisis could further increase the relative share of ADS in the overall envisaged scope of Pillar One.

80.   Another limitation of using data for a single year (namely 2016) is that the results do not take into account the potential effects of a loss carry-forward mechanism in Pillar One. The exact design of such a mechanism remains to be defined by the Inclusive Framework. The possibility for MNE groups to use past losses to offset some or all of their Amount A tax liability would reduce the amount of residual profit allocated under Pillar One. The reduction in residual profit would be larger if it were agreed that the loss carry-forward mechanism should account for profit shortfalls (i.e. prior periods where profitability falls below the agreed profitability threshold) rather than losses.

81.   In 'normal' times, the effect of including a loss carry-forward mechanism in Pillar One is likely to be moderate, given that it is relatively rare that MNE groups switch rapidly from a loss position to a profitability rate above the potential profitability thresholds considered in this chapter. For example, among MNE groups with a profitability rate above 10% in 2016, only 9% of groups have made losses in at least one of the three preceding years.[5] Another 32% have made no loss but have had a profit shortfall (i.e. profitability rate below 10%) in at least one of the three preceding years. The remaining 59% have had a profitability rate consistently above 10% over the three preceding years.

82.   However, the share of firms making losses tends to increase during economic recessions, especially severe ones. As a result, the number of MNE groups switching from making losses to having high profitability is likely to be higher in the years following recessions than after periods of economic growth. This is particularly relevant in the current situation, since many MNE groups are likely to suffer significant losses as a result of the COVID-19 crisis. As a result, the design of a loss carry-forward mechanism in Pillar One (which is still to be determined by the Inclusive Framework) could have significant implications for the revenue impacts of Pillar One, at least in the short and medium term, particularly if "pre-regime" losses incurred during the COVID-19 crisis were included in the mechanism.

### 2.3.5. Firm-level concentration of residual profit

83.   A closer analysis of the firm-level data reveals that global residual profit tends to be concentrated among a relatively small number of MNE groups. For example, assuming a EUR 750m global revenue

threshold and a 10% profitability threshold percentage, about 85% of global residual profit in ADS would be concentrated among 10 MNE groups and about 70% of global residual profit in CFB would be concentrated among 50 MNE groups.

2.4. Component B: Percentage of residual profit reallocated to market jurisdictions

84.   The percentage of residual profit reallocated to market jurisdictions (i.e. the reallocation percentage) has not yet been determined by the Inclusive Framework. Figure 2.2 presents the amount of allocable residual profit for an illustrative set of reallocation percentages (10%, 20%, 30%) and across a variety of profitability thresholds. As such, the figure illustrates the combined effects of these two parameters. For example, it shows that the amount of global residual profit would be slightly higher under a scenario with a 10% profitability threshold and a 20% reallocation percentage than under a scenario with a 15% profitability threshold and a 30% reallocation percentage.

Figure 2.2. Allocable global residual profit for different reallocation percentages
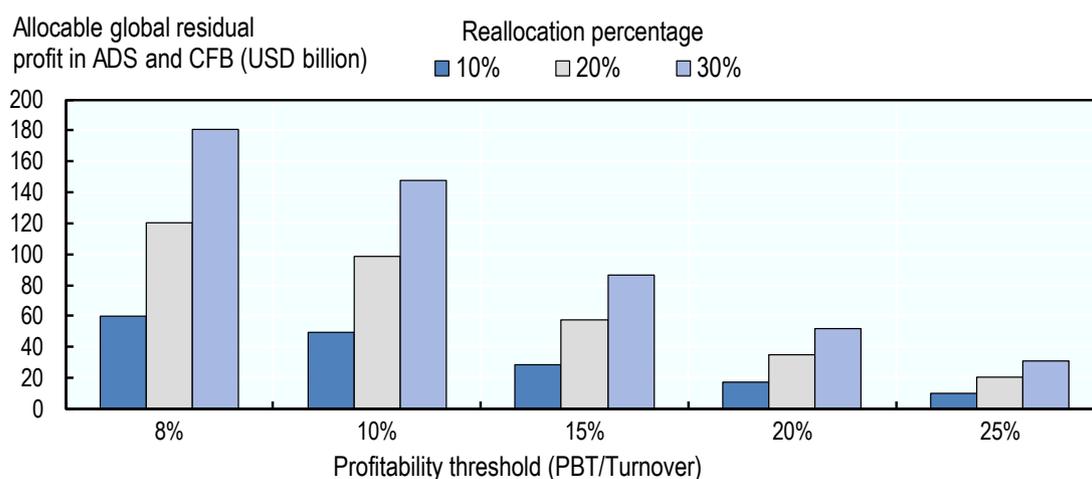
Note: These estimates are derived by multiplying the estimates of global residual profit in scope (Table 2.3, Panel B) by the allocation percentage considered. Consistent with Table 2.3, Panel B, the estimates assume a global revenue threshold of EUR 750 million and focus only on MNE groups with a primary activity in the ADS and CFB sectors.
Source: OECD Secretariat.

2.5. Component C: Share of jurisdiction in global MNE sales

85.   According to the Pillar One Blueprint report, the right to tax profits allocated under Amount A of Pillar One would be distributed amongst eligible market jurisdictions according to an allocation key, which would be "based on locally sourced in-scope revenue determined by applying the rules on scope, nexus and revenue sourcing". A set of "revenue sourcing rules" is outlined in the Pillar One Blueprint report, taking into account the specificities of the different business models associated with the activities in the scope of Pillar One. For example, for certain ADS activities such as online advertising, sourcing rules will deem revenue to arise in the jurisdiction where the user is located (e.g. where the advertising is viewed rather than the jurisdiction where the advertising is purchased, which may be different). In the case of CFB goods

sold through independent distributors, sourcing rules will deem revenue to arise in the jurisdiction of the place of final delivery of the goods to the consumer.

86.   The concept of "locally sourced in-scope revenues" broadly corresponds to the concept of "destination-based sales" that is commonly discussed in the economic literature. This latter expression is used in the remainder of this chapter and should be understood as being equivalent to the notion of "locally sourced in-scope revenues" (including regarding the location of users when relevant).

87.   Identifying with precision the location of MNE destination-based sales according to the definition outlined in the Pillar One Blueprint report poses a number of conceptual and data challenges that are discussed in the next section. In light of these challenges, the approach in this chapter, which is further detailed below, is to compute proxy measures of the global distribution of MNE destination-based sales in ADS and CFB activities at a relatively aggregate level. In the case of CFB, the approach relies on data from the OECD Analytical AMNE database, which are available across more than 50 jurisdictions. For jurisdictions where Analytical AMNE data are not available, extrapolations based on widely available and relevant macroeconomic indicators (e.g. GDP, GDP per capita, trade openness) are used.

88.   The data used to proxy for CFB sales are not well suited to assessing the location of remote digital sales. Reflecting this, a more targeted approach is used for ADS sales (the general approach employed for CFB sales being also tested as a robustness check). This approach is based on data on the number of regular internet users per jurisdiction, combined with data on the average consumption per person, as further described below. These indicators are widely available (more than 200 jurisdictions are covered). Extrapolations based on macroeconomic variables are employed to extend the coverage to the few non-covered jurisdictions.

89.   Both in ADS and CFB, the proxy indicator of MNE destination-based sales in a jurisdiction is not used in absolute terms, but only in relative terms, i.e. as a percentage of global MNE sales, which are computed by summing the indicator used across all jurisdictions.[6] This is because the analysis only requires the use of an allocation key to distribute the allocable residual profit across jurisdictions (i.e. component C in Figure 2.1). This is an important consideration because measuring the exact *level* of relevant MNE sales in a jurisdiction is more challenging than obtaining a reasonable proxy measure of the *distribution* of these sales across jurisdictions.

2.5.1. Main challenges to defining and measuring MNE destination-based sales

90.   The stylised example in Figure 2.3 illustrates some of the challenges involved in defining and measuring MNE destination-based sales. In this example, the destination-based sales of MNE Group A in jurisdiction J may include, fully or in part, (i) sales from MNE Group A entities located in J to third-party entities in J (red arrow) and (ii) direct sales into J from MNE Group A entities located in other jurisdictions (red dotted arrow). These direct sales may include remote digital sales into J (related to ADS activities, e.g. subscription to an online streaming service). They may also include direct export of physical CFB products to consumers or third-party firms in J. The extent to which these remote physical sales would give rise to nexus and be considered in the allocation under Amount A will ultimately depend on decisions to be taken by the Inclusive Framework. The Pillar One Blueprint report suggests that remote physical sales would generally not be considered unless the MNE group has a sufficient degree of engagement with the relevant market jurisdiction. The exact criteria to assess this level of engagement will be the subject of future decisions by the Inclusive Framework. For both ADS and CFB sales, another factor to determine if remote sales give rise to nexus is the potential nexus revenue threshold, as discussed further in Section 2.5.4 below.

Figure 2.3. Stylised example on destination-based sales
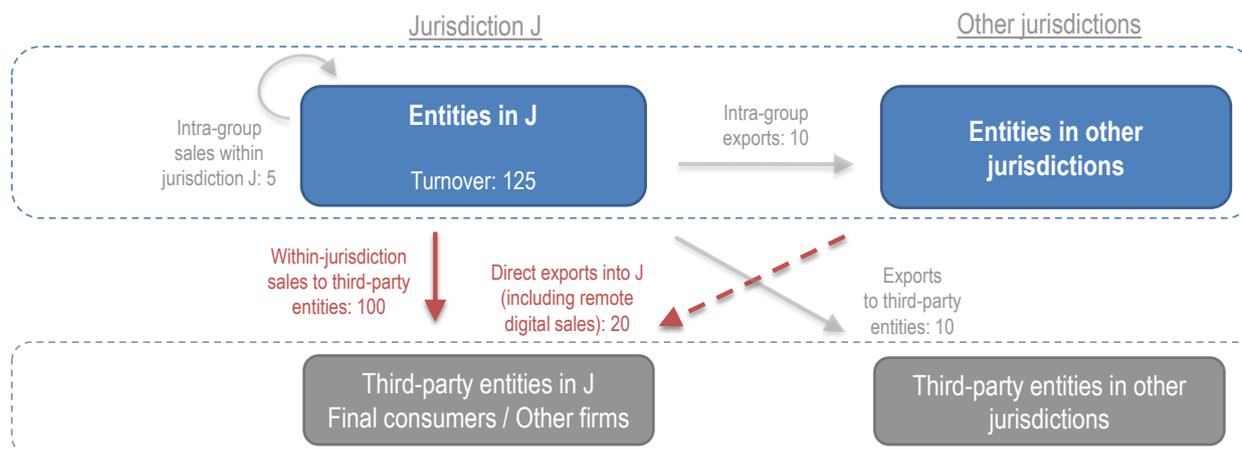
Note: This stylised example illustrates the different product flows between entities in a given MNE group (group A) and third party entities (final consumers or other firms), for the purpose of identifying destination-based sales into a certain jurisdiction (jurisdiction J). These destination-based sales may include both within-J sales (red arrow) and some (physical or digital) remote sales into J (red dotted arrow).
Source: OECD Secretariat.

91.   Measuring MNE destination-based sales poses a number of data challenges. First, data available to the OECD Secretariat lacks sufficient granularity to identify the location of the sales of individual MNE groups, meaning that the analysis has to rely on relatively aggregated data. This comes at the cost of overlooking potential effects related to heterogeneities across MNE groups (e.g. if MNE groups with high residual profit would tend to sell their products in different jurisdictions than MNE groups with low or no residual profit). In addition, data on remote digital sales, or the location of users of digital services, are scarce and of uneven quality, as further discussed below. Even for physical goods, available data in most jurisdictions generally does not allow for exports to third parties to be distinguished from exports to related parties. Finally, the available data does not allow the location of final consumers of products sold by MNEs to be observed when sales go through intermediaries, such as retailers. Reflecting all these challenges, the approach in this chapter is to build proxy measures for the distribution of CFB and ADS sales based on relatively aggregated data.

2.5.2. The proxy measure of MNE destination-based sales in CFB

Proxy of CFB sales considered and limitations

92.   The proxy measure of the destination-based sales of CFB MNEs into a jurisdiction that is used in this chapter is the turnover of MNE entities in this jurisdiction, minus the exports by MNE entities from this jurisdiction (Figure 2.4). This proxy builds on the data available on CFB MNE turnover and exports in the OECD Analytical AMNE database, as further described below. In the example of Figure 2.3, this proxy would correspond, for the MNE Group A, to the turnover of Group A entities in jurisdiction J (125), minus their exports to related-party entities (10) and to third-party entities (10). The proxy would therefore equal 125-10-10=105.

Figure 2.4. Approach to proxy CFB destination-based sales

| CFB sales in jurisdiction A | = | Turnover of MNE entities (CFB sectors) in jurisdiction A | − | Exports of MNE entities (CFB sectors) from jurisdiction A into other jurisdictions |

Computed with OECD Analytical AMNE data, focusing on domestic-owned and foreign-owned MNEs, and extrapolations where data not available
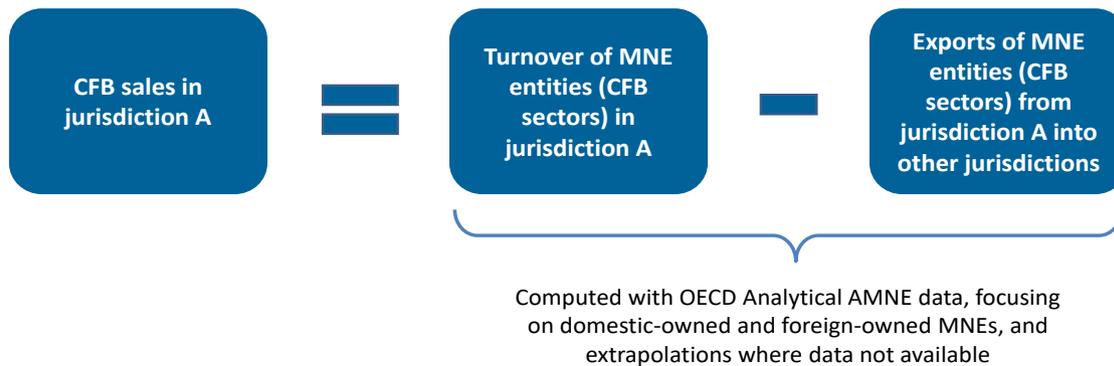
Note: CFB sectors are identified based on the NACE Rev. 2 classification and the assumptions presented in Table 2.2.
Source: OECD Secretariat

93.   This measure is arguably a better proxy of CFB destination-based sales than measures based on data on origin-based sales (e.g. US BEA data on the sales of US MNEs) or more aggregated measures that do not distinguish MNE and non-MNE sales (e.g. household consumption in national accounts). Nevertheless, it suffers from several limitations:

- In theory, intra-group sales within jurisdiction J (equal to 5 in the stylised example above) should also be subtracted from the proxy measure. In practice, the available data makes this difficult since turnover data in the Analytical AMNE database is not net of intra-group sales. This issue is likely to be of limited significance: for example, within-country intra-group sales represent only about 9% of sales among US affiliates abroad according to data on the foreign activity of US multinationals published by the US BEA.[7] Robustness checks using alternative proxies not affected by this issue (e.g. subtracting intermediate consumption from the proxy) provide broadly similar results overall.[8]

- Remote sales (i.e. the red dotted arrow in Figure 2.3), both digital and physical, are not included in this proxy measure of CFB destination-based sales. More precisely, in the proxy measure used in this chapter, remote sales are not included at their point of origin, as they are counted in turnover but subtracted when subtracting exports, and they are not included either at their point of destination. As the focus of this section is on CFB, the omission of remote digital sales (which would mainly fall in the ADS sector) is unlikely to affect significantly the results (a different method is used to proxy ADS sales, as discussed below). Regarding remote physical sales, the significance of the omission will depend on design choices to be made by the Inclusive Framework, as discussed above, on the degree of market engagement that would be necessary to give rise to nexus. In any case, it is likely that the location of remote physical sales is broadly correlated with the location of non-remote MNE sales, in which case the impact of this omission on the measure of Component C would be small. This is because the aim of component C is to measure the *share* of each jurisdiction in global destination-based sales, rather than the absolute *level* of sales in each jurisdiction.

Computation of the proxy of CFB sales with Analytical AMNE data

94.   The OECD Analytical AMNE database contains data on the turnover and exports of foreign-owned MNE entities as well as domestic-owned entities (either belonging to an MNE group or not) across 59 jurisdictions (Cadestin et al., 2018[9]).[9] In addition, the database includes a split of these domestic-owned entities between MNE and non-MNE entities, which is based on 'hard' data for 16 jurisdictions and imputations for the other jurisdictions. Finally, the database offers a breakdown of these different data across 34 industries, based on the NACE Rev. 2 classification with an aggregation at the 1-or-2-digit level,

depending on the industry. CFB sectors are identified based on this industry classification, following the assumptions presented in Panel B of Table 2.2 regarding which sectors are considered CFB.[10]

95.   The proxy measure of CFB destination-based sales (turnover of CFB MNEs minus exports of CFB MNEs) is computed directly from the Analytical AMNE database for these 16 jurisdictions where the split of domestic-owned entities between MNE and non-MNE entities is based on hard data (Figure 2.5). For the jurisdictions where the split is not based on hard data, the split is imputed based on the assumption that the share of domestically-owned MNEs in total CFB sales by domestically-owned firms corresponds to the average across those 16 jurisdictions (approximately 14%).[11] As an additional check, the sales based on this imputation are compared to the predictions of the regression used in the next section to extrapolate MNE destination-based sales to jurisdictions not covered in Analytical AMNE.[12]

Figure 2.5. Proxy measure of CFB destination-based sales
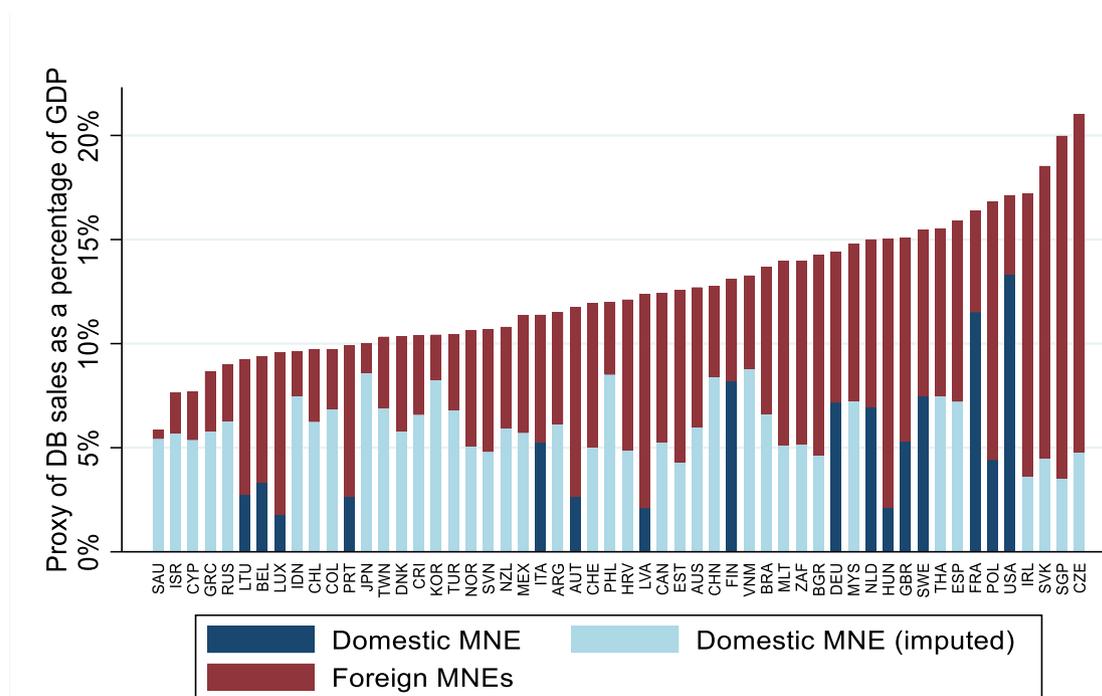
Note: This Figure presents the ratio of the proxy measure of CFB MNE destination-based sales (CFB MNE turnover minus CFB MNE exports) to GDP. The different shades of blue reflect whether the split between MNE and non-MNE entities among domestic-owned firms was based on hard data from the OECD Analytical AMNE database (dark blue bars) or was imputed (light blue bars). In the latter case, data for domestic-owned MNEs are imputed by assuming that their share in total sales by domestic firms is equal to the average among jurisdictions with hard data (i.e. jurisdictions with dark blue bars).
Source: OECD Secretariat calculations based on the OECD Analytical AMNE database.

Extrapolation of the proxy of CFB sales to jurisdictions not covered in Analytical AMNE

96.   The method to extrapolate the proxy measure of CFB destination-based sales of MNEs in jurisdictions where Analytical AMNE data are not available consists in regressing the proxy of destination-based sales constructed in the previous section (considering the total sales of domestic-owned plus foreign-owned MNEs) on a number of its potential macroeconomic drivers (e.g. GDP, trade openness). The regression is estimated over the jurisdictions where data are available in Analytical AMNE. The regression results are used to extrapolate destination-based sales to the other jurisdictions.

97.　　Regression results, which are presented in Table 2.4 suggest that CFB destination-based sales (as a share of GDP) are mainly driven by GDP, possibly because a larger market size may attract more sales from foreign-owned MNEs, and by trade openness (measured as the ratio of imports plus exports to GDP), reflecting the fact that MNE presence (both foreign and domestic) is correlated with the intensity of foreign trade. In contrast, GDP per capita and the trade balance (measured as exports less imports as a share of GDP) are not found to play a significant role once the effect of GDP and trade openness are taken into account. The specification retained for the extrapolation corresponds to the first column of the table.

Table 2.4. Regression used for the extrapolation of CFB destination-based sales

	Destination-based sales divided by GDP (log)	
Log GDP	0.0874***	0.0840***
	(3.30)	(2.88)
Log GDP per capita	-0.0314	-0.0367
	(-0.85)	(-0.97)
Log Trade openness	0.315***	0.284***
	(4.74)	(2.89)
Trade balance (level)		0.474
		(0.59)
Constant	-4.063***	-3.937***
	(-5.90)	(-5.07)
N	51	50
R-sq	0.33	0.36

Note: This table shows the regression results of the proxy for CFB destination-based sales presented above, as a share of GDP, on several macroeconomic variables. The results used for the extrapolation correspond to the first column. T-statistics are shown in parentheses. ***, **, *: denote significance at 1%, 5%, and 10% levels respectively.
Source: OECD Secretariat.

98.　　An additional adjustment is made for remittances and foreign aid. Indeed, for a given GDP level, these sources of income can increase the consumption potential (and therefore likely CFB MNE sales) in recipient countries. To take this effect into account, the ratio of destination-based sales to GDP obtained from the extrapolated regression results is multiplied by the following adjustment term: $\frac{GDP + Remittances + Foreign\ Aid}{GDP}$. Data on remittances and foreign aid are sourced from the World Bank and the OECD.[13]

Resulting proxy indicator of CFB destination-based sales

99.　　The resulting proxy measure of CFB destination-based sales is presented in Figure 2.6. Consistent with results of the regression above, larger and more open economies tend to have relatively higher sales. It is also notable that economies with similar characteristics in terms of size, income levels and openness tend to have broadly similar levels of CFB sales (as a share of their GDP).[14]

Figure 2.6. Proxy measure of CFB destination-based sales, including extrapolation

% of GDP

☐ (3,6] ☐ (6,9] ☐ (9,12] ☐ (12,15] ☐ (15,18] ☐ (18,21] ☐ (21,24]
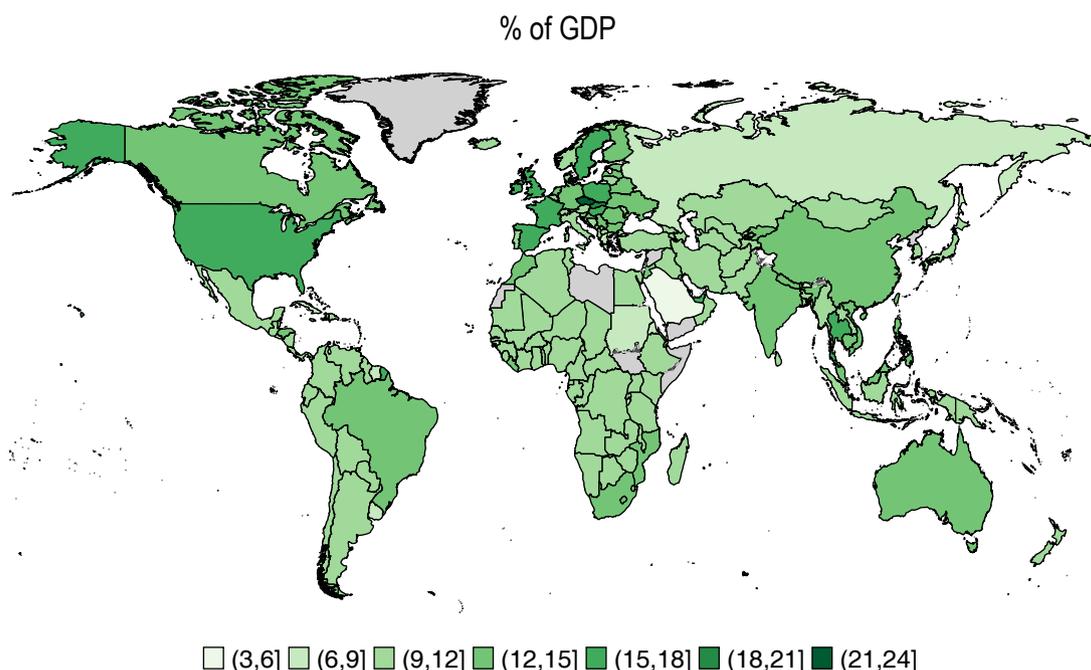
Note: Destination-based sales of CFB MNEs are proxied by CFB MNE turnover minus CFB MNE exports, using data from the OECD Analytical AMNE database. For jurisdictions not covered in the OECD Analytical AMNE database, destination-based sales are extrapolated based on a regression of CFB MNE sales on GDP, GDP per capita and trade openness. A correction is applied to take into account foreign aid and remittances, which can increase sales relative to GDP in low-income jurisdictions. CFB sales are presented as a share of GDP for comparability across jurisdictions. Grey areas correspond to missing data.
Source: OECD Secretariat.

100.   To reflect the uncertainties around the proxy measure of CFB MNE destination-based sales, the results presented in the final section of this chapter integrate an uncertainty range around the share of CFB MNE destination-based sales in a jurisdiction in global CFB MNE sales. The range is defined as ±10% around the point estimate for jurisdictions covered in Analytical AMNE data, and ±20% around the point estimate for jurisdictions where the estimates are based on the extrapolation regression, reflecting that there is more uncertainty around the extrapolated values than around the values based on hard data.

2.5.3. The proxy measure of MNE destination-based sales in ADS

101.   The methodology employed above to assess the location of CFB sales is a priori not well suited to identifying the location of ADS consumers (or users). This is because, as discussed above, the proxy measure used (turnover of MNE entities, minus exports of MNE entities) does not capture remote sales, including remote digital sales, which represent a large share of sales in the ADS sector. One could still rely on the methodology used for CFB sales, as is done in a robustness check presented in Annex 2.D, by assuming that the distribution of remote digital sales across jurisdictions is relatively well correlated with the distribution of non-remote physical sales, but a more direct approach to measuring ADS sales seems preferable.

102.   A potential approach would be to use the increasingly available data on the location of users of digital services (e.g. based on traffic on websites and mobile applications). However, the quality of these data remains uncertain and their direct use for the analysis would pose a number of methodological challenges, as discussed in Box 2.1. Overall, these data suggest that the number of users of the main digital services is relatively well correlated with internet penetration and income-per-capita levels (these two variables being strongly correlated with each other). The methodology described below is based on this insight.

### Box 2.1. Assessing the location of users of digital services

The OECD Secretariat has explored several data sources to assess the location of users of digital services, including data from Priori (on mobile application users), SEMrush (on website users) and Alexa (on both). Overall, while these data have informative value, they are still relatively untested for statistical analysis and their quality has not been judged sufficient to use them directly in the revenue estimates in this report.

Beyond data quality issues, there are other practical difficulties in assessing the location of users of MNE services and testing its effect as an allocation key for residual profit under Pillar One. One difficulty is that digital service firms can offer various services/apps simultaneously (e.g. Facebook, Instagram and WhatsApp all belong to the same MNE group) with users potentially in different locations and making varying contributions of "value". In addition, certain firms offer a combination of digital services and physical products (e.g. Apple). Finally, users can be located in multiple jurisdictions in the case of multi-sided markets (e.g. the location of the property owner and the tenant in the case of Airbnb or Booking.com).

Overall, preliminary analysis based on data from Priori, SEMrush and Alexa suggests that the location of users of large digital service providers is broadly correlated with internet penetration as well as income levels (see for example Figure 2.7 below on the correlation with income levels for two illustrative examples of services). The main exception appears to be China, where certain non-Chinese digital firms have no or limited operations and where certain Chinese digital firms operate predominantly. The "value" of users is more difficult to measure with these sources, but is also likely to depend on income levels.

Figure 2.7. Example on the location of digital services users

Number of regular monthly users (access via iOS only) per 100 inhabitants (y-axis) and GDP per capita (x-axis)
Average over year 2018
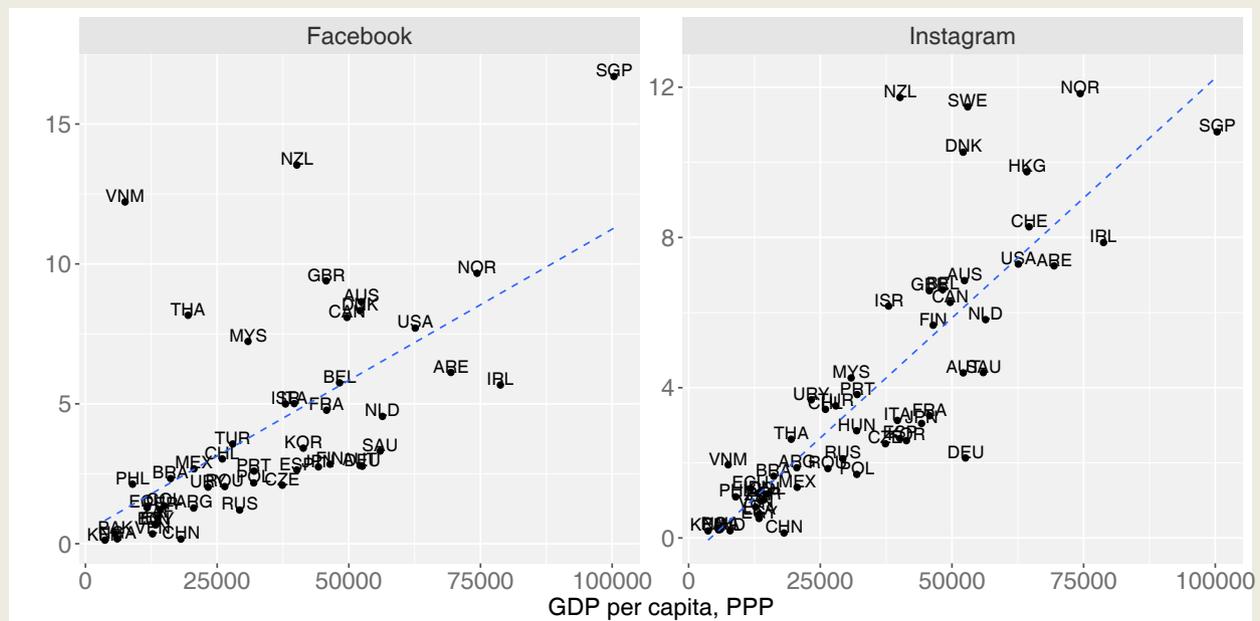
Note: Data only cover devices equipped with the iOS operating system. Therefore, they may not necessarily be representative of the frequency of use across all Internet users.
Source: OECD Secretariat calculations based on Priori data.

103.   The proxy of ADS sales in a jurisdiction used as the baseline in the analysis is (i) the number of regular internet users in a jurisdiction, multiplied by (ii) the average consumption per person in the jurisdiction (as a proxy for the average consumption of an internet user), and by (iii) the weight of ADS in the average consumption basket of an internet user (Figure 2.8). The first two variables are sourced from the International Telecommunication Union and United Nations statistics respectively.[15] In the few jurisdictions where they are not available (representing less than 1.5% of world GDP for each variable), these variables are extrapolated based on GDP per capita.[16] The third variable, which is not directly observed due to lack of comprehensive cross-country data on ADS consumption, is assumed to be constant across jurisdictions. It is not necessary to make an assumption about the exact value of this constant, given that the aim of the exercise is only to measure the share of global ADS sales taking place in each jurisdiction, rather than their absolute level.

Figure 2.8. Approach to proxy ADS destination-based sales
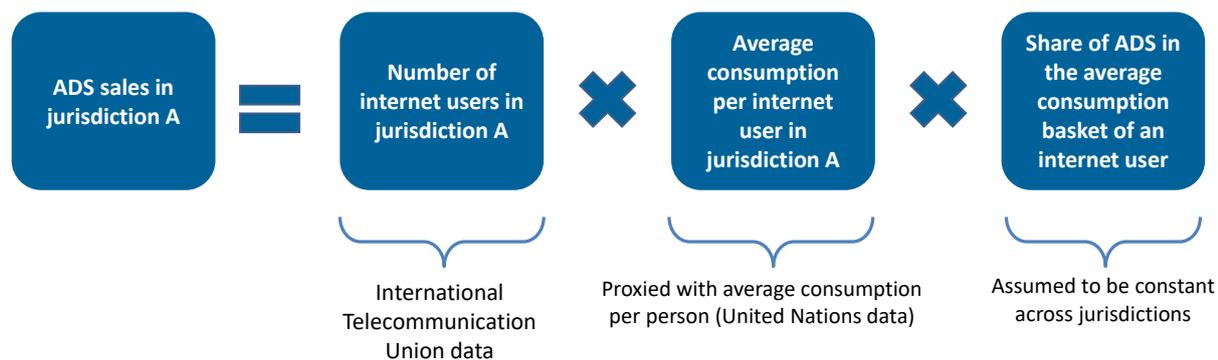

Source: OECD Secretariat

104.   This proxy measure has two main limitations that are likely to partly offset each other. First, average consumption per person is measured across the whole population of the jurisdiction, rather than among the subset of its internet users. However, internet users are likely to have higher incomes and consumption levels than non-internet users. This difference may not be consequential in jurisdictions with very high internet penetration (e.g. most OECD economies), but it could lead to a significant underestimation of sales in lower-income economies where internet penetration is relatively low. The second limitation relates to the assumption that ADS represents a constant share of the consumption basket of internet users across countries. Indeed, it is likely that ADS represents a smaller fraction of the consumption basket in lower-income jurisdictions, where a number of non-service items (e.g. food, energy) tend to have a greater weight in the consumption basket than in higher-income jurisdictions. This would lead to an overestimation of sales in lower-income jurisdictions. Overall, the effects of these two limitations go in opposite directions, implying that it is difficult to assess if the proxy measure employed overstates or understates the share of ADS sales in lower-income vs. higher-income jurisdictions.

105.   A sensitivity analysis presented in Annex 2.D suggests that overall Pillar One revenue estimates are not very sensitive to using an assumption resulting in lower ADS sales in lower income jurisdictions than the baseline assumption described above. Compared to the baseline, it is assumed in this sensitivity analysis that ADS sales in low income jurisdictions are divided by two, that ADS sales in middle income jurisdictions are divided by one and a half and that ADS sales in high income jurisdictions are unchanged.[17] The other sensitivity analysis presented in Annex 2.D suggests that using the methodology used for CFB sales instead of the baseline methodology presented in this section would also have relatively little effect on overall Pillar One revenue estimates.

106. The baseline proxy measure of ADS destination-based sales is presented in Figure 2.9. The overall distribution of ADS sales has similarities with that of CFB sales (Figure 2.6), but the distribution of ADS sales appears to be more strongly correlated to jurisdictions' income levels than CFB sales. Similar to CFB sales, uncertainty ranges are built around the estimates of ADS sales for the purpose of computing the Pillar One revenue effects presented in the final section of this chapter. These uncertainty ranges are defined as ±25% around the point estimate.

Figure 2.9. Proxy measure of ADS destination-based sales

ADS sales as a share of GDP, global average = 100

☐ (0,20] ☐ (20,40] ☐ (40,60] ☐ (60,80] ☐ (80,100] ☐ (100,120] ☐ (120,140] ■ (140,160] ■ (160,180]
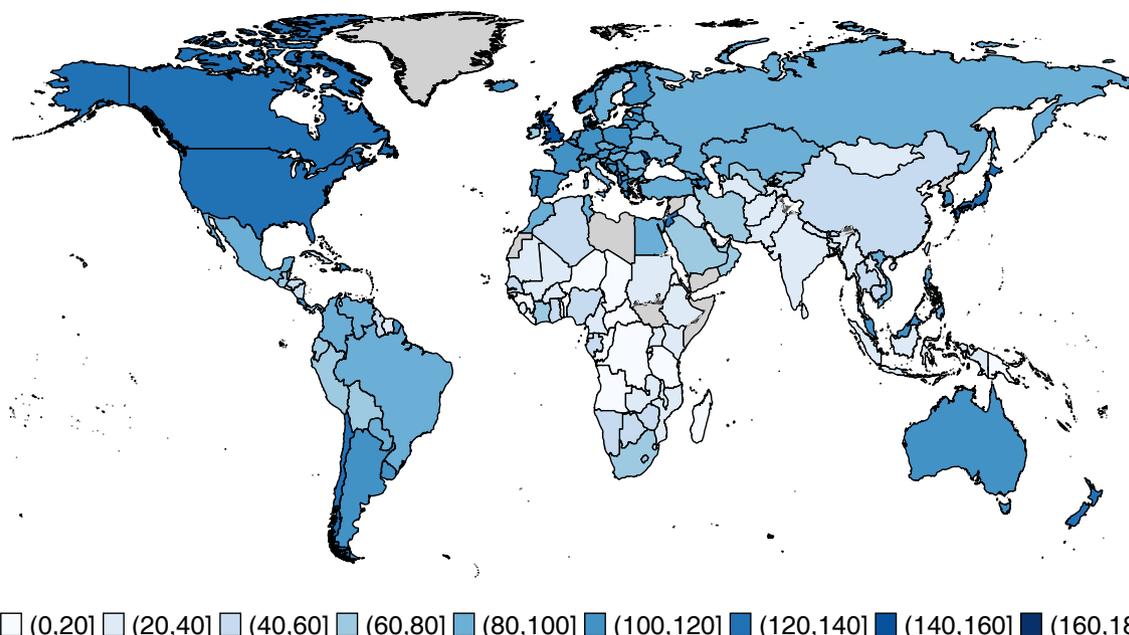
Note: Destination-based sales of ADS MNEs are proxied by (i) the number of regular internet users in a jurisdiction, multiplied by (ii) the average consumption per person in the jurisdiction (as a proxy for the average consumption of an internet user), multiplied by (iii) the weight of ADS in the average consumption basket of an internet user. ADS sales are presented as a share of GDP for comparability across jurisdictions. Their absolute level is not computed in the analysis (which focuses on the distribution across jurisdictions), which is why sales are presented relatively to the global average (GDP weighted) of the ADS sales to GDP ratio. Grey areas correspond to missing data. Data focus on year 2016.
Source: OECD Secretariat.

2.5.4. Modelling the effect of a potential nexus revenue threshold

107. New nexus rules may involve a revenue threshold to define whether an MNE group has a taxable presence in a jurisdiction. Such a nexus revenue threshold would mean that the residual profit of a given MNE group would not be allocated to the jurisdictions where the total revenues of this group are below the threshold.

108. Assessing the impact of a potential nexus revenue threshold is challenging due to a lack of comprehensive entity level data on MNE sales. To overcome this challenge, a probabilistic modelling approach has been developed to approximate the effect of an illustrative range of potential nexus revenue thresholds across jurisdictions, based on repeated simulations under a set of assumptions that is described in this section. As this approach is inevitably assumption-dependent, results should be considered as illustrative of the orders of magnitude rather than precise estimates.

109.   The intuition of the modelling is as follows. If all (ADS or CFB) MNE groups had sales in all jurisdictions in the world, a reasonable proxy of the sales of a given (ADS or CFB) MNE group in a given jurisdiction would be the global sales of this MNE group, multiplied by the average share of this jurisdiction in the global sales of all (ADS or CFB) MNEs. This proxy would overlook heterogeneities across MNEs, but it would nevertheless give a good indication of whether the sales of the group in a jurisdiction are likely to be above or below the nexus revenue threshold.

110.   In reality, the situation is more complex, since not all MNE groups have sales in each jurisdiction. To reflect this, the approach (based on the Monte Carlo method) is to carry out many simulations assuming the presence of different MNEs in different jurisdictions and to apply the nexus revenue threshold in each simulation. Finally, the effect of the nexus revenue threshold is computed as the average effect obtained across these many simulations. A benefit of this simulation approach is that it yields estimates of the average effect of the threshold, but also estimated uncertainty ranges, which are in turn used to create the uncertainty ranges around the measure of post-nexus sales that underlie the Pillar One estimates presented in the final section of this chapter.

111.   In practice, the global sales of each MNE are taken from the dataset of consolidated financial accounts (mainly based on ORBIS) used for component A of the analysis. The dataset is restricted to MNE groups with a primary activity in ADS or CFB and with global revenues above EUR 750 million. The average distribution of ADS and CFB sales across jurisdictions is taken from the estimates presented in Sections 2.5.2 and 2.5.3 above. Finally, the probability that a given (ADS or CFB) MNE group has sales in jurisdiction *j* is assumed to follow the following equation:

$$Pr(Sales\ Presence_j) = \lambda * Share\ of\ Sales_j$$

112. $Share\ of\ Sales_j$ is the share of the global sales of all (ADS or CFB) MNEs that take place in jurisdiction *j*, and λ is a scaling parameter. The idea behind the equation is that MNE groups are more likely to be present in larger markets than in smaller ones. For example, in practice, some of the largest ADS and CFB MNEs appear to have sales (or users) in almost all jurisdictions in the world, while smaller MNEs may tend to be less present in smaller markets (e.g. developing economies). This implies that smaller markets will generally have a lower number of MNEs selling in their jurisdiction. The λ parameter captures the strength of this propensity of MNEs to be more present in larger than smaller markets (a higher λ would indicate a stronger propensity to favour larger markets).[18] This parameter is not directly observed, and its value has been calibrated based on observations on the subset of jurisdictions where entity-level data is available in Eurostat FATS database. The sensitivity of the results to different values of λ has also been tested and results are broadly consistent with the baseline (see Annex 2.B).

113.   In each simulation *s*, an (ADS or CFB) MNE *m* will either have some revenues in the jurisdiction *j* considered ($Sales\ Presence_{jms} = 1$), or no revenues in this jurisdiction ($Sales\ Presence_{jms} = 0$).[19] In turn, the amount of sales of this MNE in the jurisdiction *j* is proxied by multiplying the global sales of the MNE *m* by the share of jurisdiction *j* in global (ADS or CFB) sales:[20]

$$Sales_{jms} = Sales\ Presence_{jms} * MNE\ Global\ Sales_m * Share\ of\ Sales_j$$

114.   If $Sales_{jms}$ is greater than the nexus revenue threshold considered, a share of the residual profit of *m* is allocated to *j*. The residual profit of *m* is computed based on the consolidated accounts of *m*, in the same way as in component A. In contrast, if $Sales_{jms}$ is below the nexus revenue threshold, no residual profit is assigned from MNE *m* to jurisdiction *j* in that simulation.

115.   The simulations are repeated 200 times for each MNE-jurisdiction pair. Based on this, the average amount of allocated residual profit is computed for each MNE and jurisdiction across these 200 simulations.[21] Finally, these values are summed across all MNEs and compared to the baseline estimate of residual profit allocated to that jurisdiction in the absence of the nexus revenue threshold. The results for an illustrative set of potential nexus revenue thresholds are presented in Figure 2.10 for five broad jurisdiction groups based on economy size (see the composition of the groups in Table 2.5).

116.   Overall, the effect of the revenue nexus thresholds on allocated residual profit is mainly significant in the first two groups (i.e. the smallest economies) and negligible in the last two groups (i.e. the largest economies). The magnitude of the effect among smaller economies depends significantly on the level of the threshold considered. Finally, for the thresholds considered in this chapter, the effect of the threshold on the amount of global residual profit allocated is small (reduction by less than 0.2%), implying that the threshold would not affect significantly the amount of double tax relief that would be provided by relieving jurisdictions (estimated in component E below).

Figure 2.10. Estimated effect of a potential revenue nexus threshold on allocated profit

For revenue nexus thresholds of EUR 1m, EUR 3m and EUR 5m, compared to a situation with no threshold
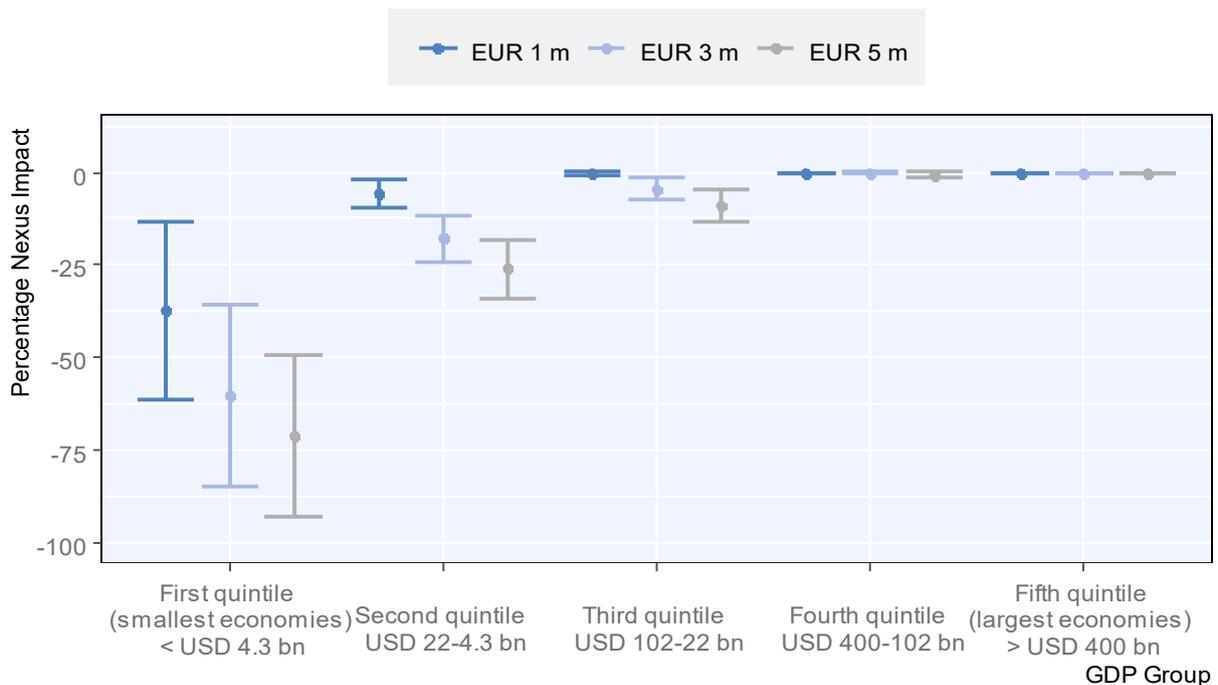
Note: For example, the application of a revenue nexus threshold of EUR 1 million is estimated to reduce the amount of allocated residual profit by 13.2% to 61.1% on average among the first group of jurisdictions (i.e. the smallest jurisdictions, which have a GDP below USD 4.3 bn, see Table 2.5) compared to a situation without revenue nexus threshold. The intervals are based on the standard deviation of results across the repeated simulations. The results presented in this Figure combine ADS and CFB results.
Source: OECD Secretariat

Table 2.5. Details of jurisdiction groupings for revenue nexus threshold results

Jurisdiction Group by GDP Range (USD bn)	Jurisdictions in Group
First quintile (smallest economies) <4.3 bn (26 jurisdictions)	Andorra, Anguilla, Antigua and Barbuda, Aruba, Bailiwick of Guernsey, Belize, British Virgin Islands, Cabo Verde, Cayman Islands, Cook Islands, Curacao, Djibouti, Dominica, Faroe Islands, Greenland, Grenada, Liberia, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, San Marino, Seychelles, Sierra Leone, Turks and Caicos Islands
Second quintile 22-4.3 bn (26 jurisdictions)	Armenia, Bahamas, Barbados, Benin, Bermuda, Botswana, Brunei Darussalam, Burkina Faso, Congo, DPRK, Gabon, Georgia, Haiti, Iceland, Isle of Man, Jamaica, Jersey, Liechtenstein, Maldives, Malta, Mauritius, Monaco, Mongolia, Papua New Guinea, Senegal, Zambia
Third quintile 102-22 bn (26 jurisdictions)	Angola, Bahrain, Bulgaria, Cameroon, Costa Rica, Cote d'Ivoire, Croatia, Dominican Republic, DRC, Estonia, Kenya, Latvia, Lithuania, Luxembourg, Macau (China), Oman, Panama, Paraguay, Serbia, Slovak Republic, Slovenia, Sri Lanka, Trinidad and Tobago, Tunisia, Ukraine, Uruguay
Fourth quintile 400-102 bn (26 jurisdictions)	Austria, Chile, Colombia, Czech Republic, Denmark, Egypt, Finland, Greece, Hong Kong (China), Hungary, Ireland, Israel, Kazakhstan, Malaysia, Morocco, New Zealand, Norway, Pakistan, Peru, Portugal, Qatar, Romania, Singapore, South Africa, United Arab Emirates, Viet Nam
Fifth quintile (largest economies) >400 bn (25 jurisdictions)	Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Netherlands, Nigeria, Poland, Russia, Saudi Arabia, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States

Note: GDP is based on 2016 GDP data.
Source: OECD Secretariat.

2.6. Component D: Tax rate on residual profit received

117.   The assumption for the purpose of modelling in this chapter is that the residual profit allocated to a jurisdiction would be taxed at the statutory CIT rate of this jurisdiction.[22] In practice, the tax rate used in the estimates is the combined CIT rate (i.e. national plus subnational) sourced from the 2019 data from the OECD Corporate Tax Statistics database, which covers more than 90 jurisdictions (OECD, 2020[10]). For jurisdictions not covered in the OECD Corporate Tax Statistics database, other sources of data are used (namely, the International Bureau of Fiscal Documentation, KPMG, EY and the Tax Foundation).

2.7. Component E: Share of jurisdiction in global residual profit

118.   Component E focuses on the 'relieving jurisdictions', i.e. jurisdictions from which residual profit would be taken for reallocation. In practice, it is envisaged that these jurisdictions would provide "double tax relief" to ensure that the profit allocated to other jurisdictions would not be subject to double taxation.

119.   The exact design of double tax relief rules remains the subject of future decisions by the Inclusive Framework, both regarding the identification of the entities benefitting from double tax relief and whether double tax relief is provided by exempting the reallocated profits from tax or providing a tax credit for the foreign tax incurred, as discussed in the Pillar One Blueprint report. The estimates in this chapter are based on the illustrative assumption that double tax relief would be provided under the exemption method, and that jurisdictions would provide double tax relief in proportion to the share of the global residual profit of the MNE group considered that is located in their jurisdiction. As stated elsewhere in this chapter, this assumption should not be seen as prejudging any final decisions to be taken by the Inclusive Framework. Different rules on double tax relief would be difficult to model precisely with the data available to the OECD Secretariat, but they could yield different results from the estimates in this chapter.

### 2.7.1. Main challenges to assess the location of residual profit

120.   Assessing the location of residual profit of ADS and CFB MNE groups across jurisdictions poses three main challenges:

- Entity-level data is only available to the OECD Secretariat for a subset of 24 jurisdictions, i.e. jurisdictions where the coverage of ORBIS unconsolidated account data is good. In other jurisdictions, only relatively aggregated data are available to the OECD Secretariat. However, trying to compute residual profit by applying a profitability threshold directly on data aggregated at the jurisdiction level would be misleading. For example, if a jurisdiction has two unrelated MNE entities of equal size, one having a 20% profitability rate and the other a 0% profitability rate, the profitability rate at the aggregate level would equal 10%. If residual profit is defined with a 10% profitability threshold, aggregate numbers taken at face value would suggest that there is no residual profit in this jurisdiction, while there is in fact residual profit in the first entity.

- Most of the data on profit location that is available to the OECD Secretariat (including anonymised and aggregated CbCR data) does not contain sectoral information, making it difficult to identify ADS and CFB MNEs from out-of-scope MNEs.

- Even once the amount of residual profit of an MNE group in each jurisdiction is identified, the share of this residual profit that would give rise to double tax relief depends on the amount of residual profit at the group-wide level, as computed based on the consolidated accounts of the group. Indeed, the sum of residual profit computed on a jurisdiction by jurisdiction basis (i.e. "bottom-up") could be different from the "top-down" measure of residual profit obtained on the consolidated accounts as described in component A above. In general, the "bottom-up" measure tends to be higher than the "top-down" measure. This is because of averaging effects, similar to those described in the first bullet point above. For example, an MNE group composed of two entities with profitability of 5% and 15% respectively could have an average profitability of 10% at the consolidated level. Using a 10% profitability threshold to define residual profit, it would have no residual profit with a "top-down" measure of profitability, but it would have some (in the second entity) using a "bottom-up" measure.[23]

2.7.2. Overall approach to assess the location of residual profit

121.   To address these different challenges, the approach in this chapter follows a number of steps, which are summarised in Figure 2.11 and further detailed in the following sections. The ultimate goal is to build a 'residual profit matrix' mapping the amount of residual profit that would be subject to double tax relief in each jurisdiction (matrix rows) and for each jurisdiction of ultimate parent (matrix columns). For example, the France-United States cell would contain the total amount of profit of US MNEs in France that would be subject to double tax relief.

Figure 2.11. Overview of the methodology to assess the location of residual profit
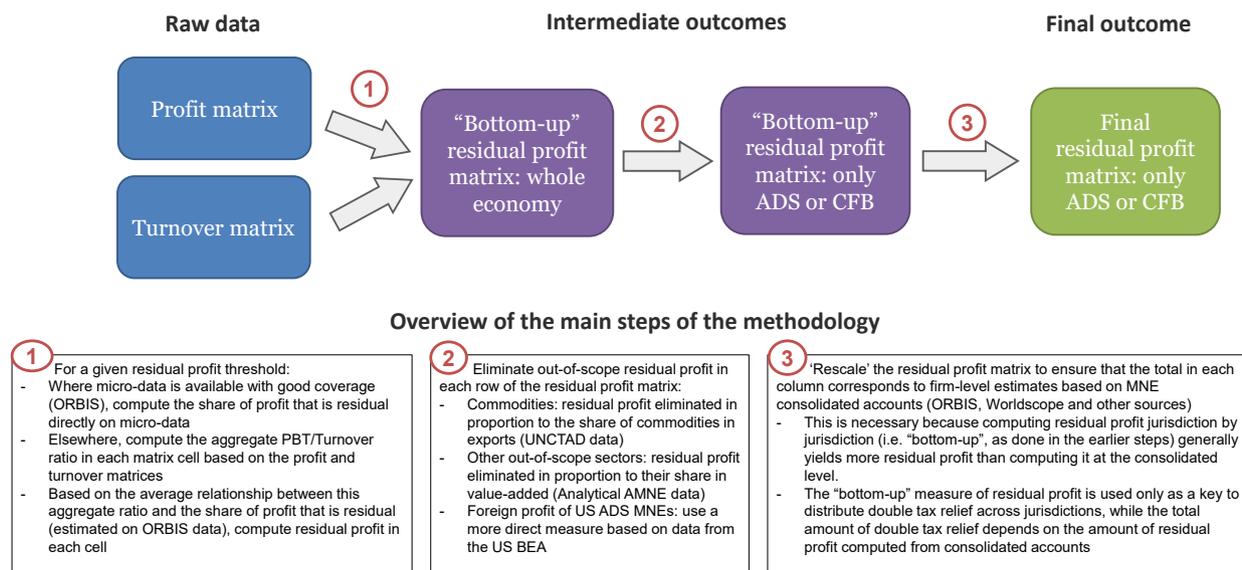
Source: OECD Secretariat

122. The main steps to build this residual profit matrix – for a given profitability threshold – are the following:

1. The first step is to compute a 'bottom-up' residual profit matrix (i.e. where residual profit is computed jurisdiction by jurisdiction, regardless of the total amount of residual profit at the consolidated level), focusing on the whole economy (i.e. without consideration of Pillar One scope) and without consideration of a potential global revenue threshold.[24] The starting point for this is to build a 'profit matrix', which combines several data sources in a consistent framework to map the location of profit across jurisdictions (see section 2.7.3 and Chapter 5 for more details). The share of profit in this matrix that is deemed residual – for the profitability threshold considered – is computed using entity-level data from ORBIS in jurisdictions with good ORBIS coverage (see list in Annex 5.A of Chapter 5). For matrix cells in other jurisdictions, the approach is to use the aggregate ratio of profit to turnover, as computed from the profit matrix and a turnover matrix built using the same approach (see section 2.7.4 and Chapter 5). Because of the 'averaging' challenge discussed above, the aggregate ratio in a jurisdiction cannot be used directly to assess the share of residual profit in that jurisdiction. Instead, this share of residual profit is projected based on the average relationship between the aggregate ratio and the share of residual profit in a jurisdiction. This relationship is estimated using ORBIS firm-level data in jurisdictions with good coverage, as further described in section 2.7.5 below.

2. The second step is to eliminate residual profit from out-of-scope sectors to obtain a residual profit matrix focusing only on ADS and CFB. As the share of different sectors in profit is not directly observed, this step relies on the following proxies: (i) to eliminate residual profit related to commodities, the share of commodities in exports (based on data from UNCTAD)[25], (ii) to eliminate residual profit from other out-of-scope sectors, the share of these sectors in value added (based on OECD Analytical AMNE data). One exception is the residual profit of US MNEs in the ADS sector, where a more direct method is employed, thanks to the greater level of detail offered by the data published by the US BEA (see details in section 2.7.6).

3. The third and final step is to 'rescale' the residual profit matrix based on the 'top-down' estimates of residual profit based on MNE consolidated accounts for each jurisdiction of ultimate parent, as computed in component A of the methodology, and taking into account the application of a potential

global revenue threshold. As such, the jurisdiction by jurisdiction (i.e. "bottom-up") measure of residual profit is only used as a key to determine the proportions in which this amount would be taken from relieving jurisdictions. For example, if the consolidated accounts of an MNE group indicate a top-down residual profit of 100, while the jurisdiction by jurisdiction approach indicates a bottom-up residual profit of 60 in one jurisdiction, 60 in a second and 30 in a third, then the total bottom-up residual profit is 60+60+30=150, which is greater than 100. In this case, it is assumed that 40 (i.e. 60*100/150) is subject to double tax relief in the first jurisdiction, 40 from the second and 20 (i.e. 30*100/150) from the third, so that the sum of residual profit relieved (40+40+20=100) corresponds to the top-down measure of residual profit.

123.   These steps are presented in more detail, along with intermediate results, in the following sections.

2.7.3. Building a 'profit matrix' to map the location of MNE profits

124.   Identifying the location of profit across jurisdictions is challenging due to limitations of existing data sources. Indeed, there is no single data source currently available that provides a comprehensive coverage across all jurisdictions. Reflecting this, the approach adopted in this report to assess the location of MNE profit is to combine data from different sources in a 'profit matrix', in order to ensure wide geographic coverage, while using for each data point the most reliable data source available. The other advantage of this approach is that when several data sources are available for the same data point, these sources can be used to benchmark each other, ensure consistency and identify potentially outlying values.

125.   In practice, the 'profit matrix' contains the total profit of MNE entities for each possible 'ultimate parent-affiliate' pair of jurisdictions (Figure 2.12). For example, the France-United States cell would contain the total profit of US MNEs in France. The profit matrix can be seen as a square table of more than 200 columns (each column corresponding to a jurisdiction of ultimate parent) by more than 200 rows (each row corresponding to a jurisdiction of affiliate).

Figure 2.12. Profit matrix: Stylised overview and underlying data sources
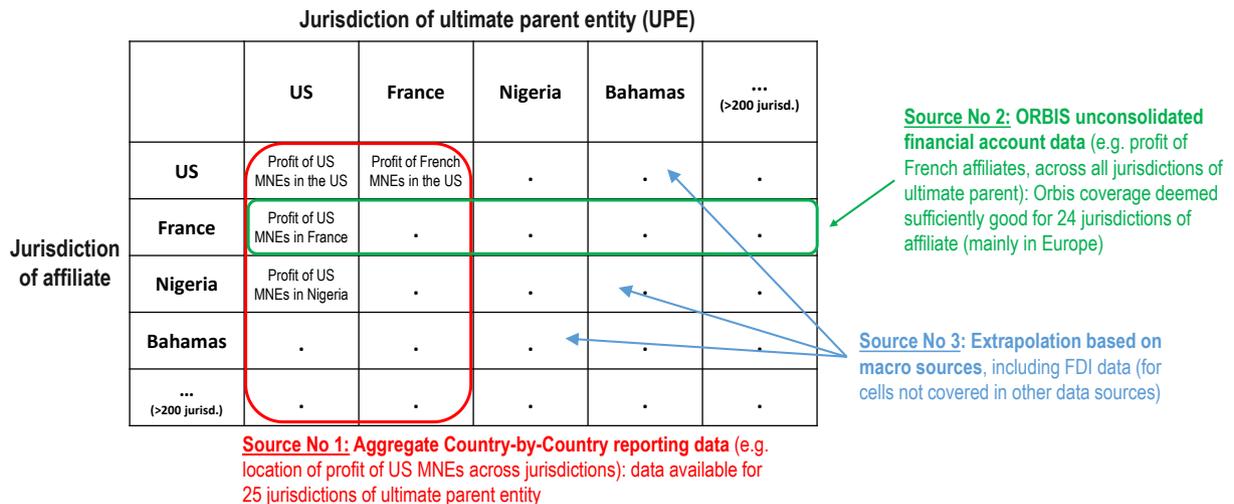
Note: Anonymised and aggregated CbCR data are used to fill *columns* of the profit matrix (e.g. profit of French MNEs across jurisdictions). ORBIS unconsolidated account data are used to fill *rows* of the profit matrix (i.e. MNE profit in France, split across ultimate parent jurisdictions). These two sources are used only where available, and in the case of ORBIS, where data coverage is sufficiently good. Other cells in the profit matrix are filled with extrapolations based on macroeconomic data, including FDI data.
Source: OECD Secretariat.

126.   The profit matrix draws on three main sources of data, presented below in descending order of preference.

1) Anonymised and aggregated data from Country-by-Country Reports (CbCRs), across 25 jurisdictions of ultimate parent (see list in Annex 5.A of Chapter 5);

2) ORBIS unconsolidated account data in 24 jurisdictions of affiliate with good ORBIS coverage (see list in Annex 5.A of Chapter 5);

3) Extrapolations based on macroeconomic data (e.g. FDI data) in other cells.

127.   Wherever possible, the data in the profit matrix (and in the turnover matrix described below) focus on MNE sub-groups with positive profits only (i.e. entities belonging to an MNE group that is reporting an overall profit in the jurisdiction considered), rather than all MNE sub-groups (i.e. profit-making *and* loss-making sub-groups). This focus on profit-making subgroups is adequate for the assessment of the location of residual profit, which is the aim of this section, since loss-making subgroups cannot be expected to have residual profit.

128.   The profit matrix – at a relatively high level of aggregation – is displayed in Table 2.6. The full methodology underlying the construction of the profit matrix is presented in detail in Chapter 5. Chapter 5 also contains detailed information on the data sources used in the profit matrix, including a discussion of the caveats around their use. In addition, Chapter 5 displays a more disaggregated version of the profit matrix (i.e. with more jurisdiction groups than in Table 2.6), as well as information on the relative importance of the different data sources underlying the matrix. Finally, Chapter 5 contains the results of the extensive benchmarking that were undertaken to assess the quality of the data and its consistency across sources.

Table 2.6. Profit matrix: Results aggregated by broad jurisdiction groups, whole economy

		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	3569.1	44.1	0.1	171.3	**3784.5**
	Middle income (105)	366.2	821.8	0.1	167.9	**1356.0**
	Low income (29)	1.3	1.3	3.1	0.2	**5.8**
	Investment Hubs (24)	650.9	69.5	0.0	314.3	**1034.7**
	Total	**4587.4**	**936.7**	**3.3**	**653.7**	**6181.1**

Note: Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. The number of jurisdictions in each group is indicated in parentheses. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP.
Source: OECD calculations based on a variety of sources including anonymised and aggregated CbCR data, ORBIS and macroeconomic data. See Chapter 5 for more details.

2.7.4. Building a turnover matrix

129.   To assess the share of profit that can be considered residual across the profit matrix, it is necessary to compute the ratio of profit to turnover across matrix cells. To this end, a turnover matrix has been built, using the same approach as the profit matrix. For the sake of internal consistency, the same data sources as in the profit matrix are used as much as possible, the same source preference order is applied and the data also focus on MNE sub-groups with positive profits. The detailed methodology and data sources are described in Chapter 5. An aggregated version of the turnover matrix is presented in Table 2.7.

Table 2.7. Turnover matrix: Results aggregated by broad jurisdiction groups, whole economy

	(USD billion of 2016)	Jurisdiction of ultimate parent				
		High income	Middle income	Low income	Investment Hubs	Total
Jurisdiction of affiliate	High income (64 jurisd.)	37034.1	943.4	19.0	2602.3	**40598.7**
	Middle income (105)	4392.3	11281.2	11.5	1895.1	**17580.1**
	Low income (29)	50.4	22.4	45.4	11.3	**129.6**
	Investment Hubs (24)	3398.3	176.9	3.6	1487.3	**5066.2**
	Total	**44875.1**	**12423.9**	**79.6**	**5996.0**	**63374.6**

Note: Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP.
Source: OECD Secretariat calculations based on a variety of sources including anonymised and aggregated CbCR data, ORBIS, Analytical AMNE data, AMNE data and macroeconomic variables. See Chapter 5 for more details.

2.7.5. Building a 'bottom-up' residual profit matrix

130.	The construction of a 'bottom-up' residual profit matrix requires assessing the share of profit that is considered residual across all cells of the profit matrix. This is done directly using ORBIS unconsolidated account data for the jurisdictions where ORBIS coverage is good for both domestic-owned and foreign-owned MNE entities (see list in Annex 5.A of Chapter 5).[26] In each of the jurisdictions considered, the total profit of each MNE sub-group is computed (by summing all MNE entities from the same MNE group that operate in this jurisdiction)[27] and divided by the total turnover of the MNE sub-group (computed in the same way). Profit above the considered residual profit threshold is then deemed residual. Finally, the total share of profit that is residual is computed by summing all residual profit across MNE sub-groups and dividing it by total profit of MNE sub-groups with positive profits within this jurisdiction.

131.	For the matrix cells in other jurisdictions of affiliate, the share of profit that is residual is assessed based on the aggregate profit-to-turnover ratio (computed from the profit and turnover matrices) and the average relationship between the share of residual profit and this aggregate ratio across jurisdictions. This average relationship is estimated over the jurisdictions j with good ORBIS coverage:

$$\left(\frac{Residual\ profit}{Total\ Profit}\right)_j = \alpha + \beta \left(\frac{Total\ profit}{Total\ turnover}\right)_j$$

132.	This relationship, estimated for a 10% profitability threshold on profit-to-turnover, is presented in Figure 2.13, where each dot corresponds to one jurisdiction. There is no theoretical reason why this relationship should be linear, but in practice the number of observations is insufficient to consider more complex specifications. Also, it is not obvious that more complex specifications would significantly improve the quality of the fit compared to the linear specification presented in Figure 2.13.

133.	The correlation for other potential profitability thresholds, not presented in this chapter, is broadly similar to the correlation observed with a 10% threshold, but the coefficients α and β depend on the profitability threshold considered. In general, a higher threshold to define residual profit would lead to a lower α since it would reduce the amount of residual profit, while the potential differences in β would depend on the shape of the distribution of profit across jurisdictions. The analysis makes use of the specific coefficients α and β corresponding to the profitability threshold considered (e.g. results for a 20% profitability threshold are based on the α and β estimated for that threshold).

Figure 2.13. Average relationship between the share of residual profit and the aggregate profit to turnover ratio
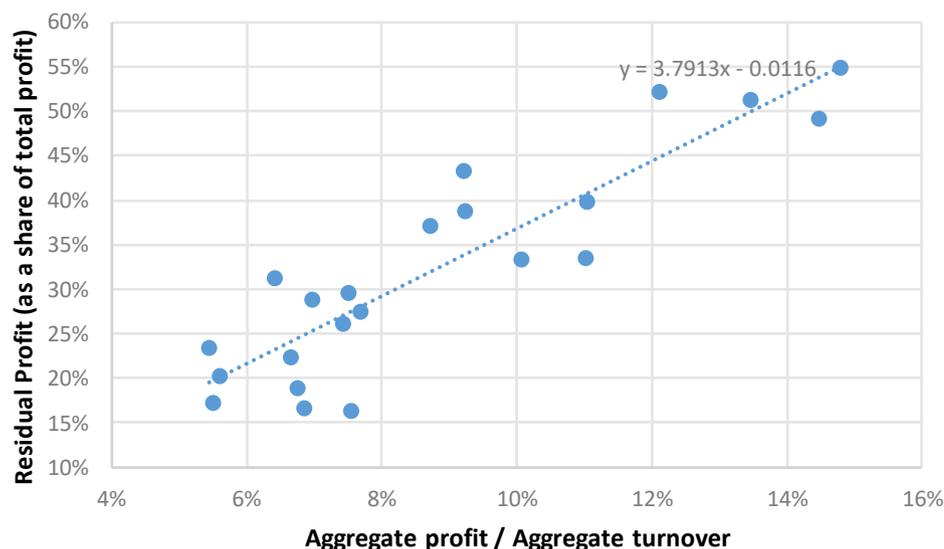
Note: Each dot corresponds to one jurisdiction. The sample consists of jurisdictions with relatively good coverage of unconsolidated accounts in ORBIS. Residual profit is computed for each MNE by applying a 10% threshold on the ratio of profit before tax (PBT) to turnover on the MNE accounts at the jurisdiction level (sum of all unconsolidated entities of the MNE in the jurisdiction considered). Loss-making MNEs in the jurisdiction are excluded from the sample. The ratio of total profit to turnover is computed from ORBIS using the same sample of firms to ensure consistency in the approach.
Source: OECD calculations based on ORBIS data.

134.   Based on this method, 'bottom-up' residual profit matrices can be computed. Since the residual profit matrix depends on the profitability threshold considered, there is not a unique residual profit matrix. Instead, a different residual profit matrix can be computed for each profitability threshold. The results presented in this section focus illustratively on a 10% and a 20% profitability threshold. The resulting matrices are presented in Table 2.8. The matrices focus on the whole economy (rather than only ADS and CFB) and are based on a 'bottom-up' jurisdiction-by-jurisdiction computation of residual profit (rather than a 'top-down' computation based on consolidated group-level accounts), which explains why the total amount of residual profit is much higher than in the corresponding component A estimates above.

Table 2.8. 'Bottom-up' residual profit matrix, whole economy

		Panel A: Assuming a 10% profitability threshold				
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	1394.1	20.0	0.0	65.9	**1480.0**
	Middle income (105)	165.8	254.7	0.1	76.2	**496.8**
	Low income (29)	0.8	1.0	0.8	0.1	**2.7**
	Investment Hubs (24)	503.8	66.4	0.0	260.4	**830.6**
	Total	**2064.4**	**342.2**	**0.9**	**402.5**	**2810.0**

Panel B: Assuming a 20% profitability threshold					
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	High income	Middle income	Low income	Investment Hubs	Total
Jurisdiction of affiliate	High income (64 jurisd.)	710.4	12.3	0.0	38.5	**761.3**
	Middle income (105)	94.0	113.5	0.1	50.2	**257.8**
	Low income (29)	0.5	0.8	0.3	0.1	**1.7**
	Investment Hubs (24)	402.4	64.1	0.0	224.7	**691.3**
	Total	**1207.3**	**190.8**	**0.4**	**313.5**	**1712.0**

Note: Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP. This 'bottom-up' residual profit matrix considers the amount of residual profit computed jurisdiction by jurisdiction, based on a 10% (Panel A), or 20% (Panel B) PBT to turnover profitability threshold including all sectors. Source: OECD Secretariat.

2.7.6. Focusing the 'bottom-up' residual profit matrix on ADS and CFB sectors

135.   The aim of this step of the methodology is to eliminate residual profit from out-of-scope sectors to obtain a residual profit matrix focusing only on ADS and CFB. This is not straightforward as the share of different sectors in profit (and even more so in residual profit) is generally not observed in the available data (e.g. anonymised and aggregated CbCR data). The only exception is data from the US BEA, which combines geographic and sectoral information on the location of MNE profit and sales, as further discussed below.

136.   Against this background, the methodology is based on the following proxies and assumptions:

- The share of residual profit related to commodities in a jurisdiction is assumed to be proportional to the share of commodities in the merchandise exports of this jurisdiction. Data on the composition of exports by product category is taken from the merchandise trade matrix of UNCTAD.[28]

- Residual profit from other out-of-scope sectors is more difficult to identify and may be spread more evenly across jurisdictions than commodity-related residual profit, which is likely to be primarily concentrated among commodity-producing jurisdictions. The share of residual profit from these other out-of-scope sectors is assumed to be proportional to the share of these out-of-scope sectors in the value added of MNEs in the jurisdiction considered. These shares are computed from OECD Analytical AMNE data, which presents the advantage of combining the geographic and sectoral dimensions. Unfortunately, Analytical AMNE data does not cover profit, and the distribution of value added is the closest available proxy of the distribution of profit. ADS and CFB sectors in Analytical AMNE are identified in the same way as in the section 2.5 above.

137.   One exception to this methodology is made for the residual profit of US MNEs in the ADS sector, where a more direct method is employed based on detailed data from the US BEA. For these MNEs, the distribution of residual profit outside of the United States is computed based on the location of profit (using 'profit-type return' as the measure of profit) and sales of MNEs in the 'information sector'. While this sector does not exactly overlap with ADS, it seems sufficiently close to be used as a proxy.[29] This approach is possible only for US MNEs, since other jurisdictions do not publish data with the same level of detail, i.e. combining geographic and sectoral information on the location of MNE profits and sales. The approach based on BEA data is preferred to the methodology described above that is used in other jurisdictions, since it offers more direct information on the location of profit and sales in the ADS sector. The measure of profit used ('profit-type return') is not subject to the double counting issue pointed out by Blouin and Robinson (2019[11]) (see also the discussion in Clausing (2020[12])). For consistency with the rest of the methodology, the share of profit of US ADS MNEs that is residual in each foreign jurisdiction is computed based on the aggregate ratio of profit to sales (from the BEA data) and the relationship presented in

Figure 2.13. In contrast to ADS, the BEA data is not used for CFB, as CFB activities would be much more difficult to isolate in the BEA data (most sectors in the BEA data containing a mix of CFB and non-CFB activities).

138.   The resulting 'bottom-up' residual profit matrices focusing on ADS and CFB, for a 10% and 20% profitability threshold, are presented in Table 2.9. The amounts of global residual profit are much lower than in Table 2.8, reflecting that the scope has been narrowed compared to that table. Indeed, estimates in Table 2.8 cover the whole economy, including out-of-scope activities. Still, the amount of global residual profit remains significantly higher than computed in component A above (see Table 2.3), confirming the need for the 'rescaling' undertaken in the next section.

Table 2.9. 'Bottom-up' residual profit matrix, ADS and CFB only

	Panel A: Assuming a 10% profitability threshold					
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	531.4	6.4	0.0	24.0	**561.8**
	Middle income (105)	57.2	87.9	0.0	24.5	**169.5**
	Low income (29)	0.2	0.2	0.2	0.0	**0.7**
	Investment Hubs (24)	192.4	26.5	0.0	104.4	**323.4**
	Total	**781.2**	**121.0**	**0.3**	**152.9**	**1055.3**

	Panel B: Assuming a 20% profitability threshold					
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	268.8	3.9	0.0	13.6	**286.2**
	Middle income (105)	30.7	39.5	0.0	16.8	**87.0**
	Low income (29)	0.1	0.2	0.1	0.0	**0.4**
	Investment Hubs (24)	152.1	25.7	0.0	90.4	**268.1**
	Total	**451.8**	**69.1**	**0.1**	**120.7**	**641.8**

Note: Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP. This 'bottom-up' residual profit matrix considers the amount of residual profit computed jurisdiction by jurisdiction, based on a 10% (Panel A) or 20% (Panel B) PBT to turnover profitability threshold, including only ADS and CFB MNEs.
Source: OECD Secretariat.

2.7.7. Residual profit matrix: Rescaling to ensure consistency with 'top-down' measure of residual profit

139.   The last step to obtain the final 'top-down' residual profit matrix that is used to compute the amount of profit subject to double tax relief across jurisdictions is to rescale the 'bottom-up' matrix presented in Table 2.9 to ensure that it matches with 'top-down' estimates of residual profit. As discussed above, this rescaling is required to take into account the fact that the 'bottom-up' measure of residual profit would only serve as a key to identify where double tax relief should occur, while the total amount of double tax relief to provide would depend on the amount of residual profit as computed based on MNE consolidated accounts. For example, certain MNE groups may have a profitability above the profitability threshold in

some jurisdictions, but low profitability in some other jurisdictions, allowing them to offset partly or fully this residual profit.[30]

140. This rescaling is done by adjusting residual profit proportionally within each column of the 'bottom-up' matrix, to ensure that the total residual profit in each column equals the total residual profit of the MNEs with an ultimate parent in the jurisdiction considered, as computed from the database of consolidated MNE group accounts used in the analysis of component A, focusing only on ADS and CFB MNEs. For example, if US MNEs have a total residual profit of 100 in the 'bottom-up' matrix (i.e. total residual profit in the US column) and if the consolidated financial accounts of US MNEs indicate a total residual profit of 60, then the rescaling consists in reducing by 40% the amount in each cell of the US column of the 'bottom-up' residual profit matrix to obtain the final 'top-down' matrix.

141. This rescaling ensures consistency between the final residual profit matrix and the estimates of global residual profit presented in component A above, and therefore ensures that the amount of residual profit allocated under Pillar One equals the amount of residual profit on which double tax relief is provided. The rescaling also takes into account the potential implications of applying a global revenue threshold under Pillar One. This is because the estimates of residual profit used as column totals take into account the application of this revenue threshold. For example, if under the revenue threshold considered, a jurisdiction of ultimate parent sees some of its MNE groups being excluded from scope, and that these MNE groups were representing 30% of the total residual profit of all MNE groups from this jurisdiction, then the amount of residual profit in the column corresponding to this jurisdiction will be reduced by 30% compared to the situation without revenue threshold. This methodology ultimately ensures that global residual profit in each column of the final matrix is consistent with the estimate from component A after application of the revenue threshold.[31]

142. The final residual profit matrices, for a 10% and 20% profitability threshold and a EUR 750 million global revenue threshold, are presented in Table 2.10. The total residual profit is close to USD 500 billion in the first case, and about USD 170 billion in the second. By construction, these totals correspond exactly to the estimates in component A for the same assumptions (presented in Table 2.3). Based on these assumptions, the results indicate that the residual profit of ADS and CFB MNEs is primarily located in high income jurisdictions and investment hubs, suggesting that they would be the main jurisdictions providing double tax relief, while there is very little residual profit in low income jurisdictions.

Table 2.10. Final 'top-down' residual profit matrix used to compute double tax relief, ADS and CFB

	Panel A: Assuming a 10% profitability threshold and a EUR 750 million global revenue threshold					
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	275.3	1.2	0.0	11.8	**288.3**
	Middle income (105)	26.7	26.1	0.0	5.7	**58.5**
	Low income (29)	0.1	0.1	0.0	0.0	**0.1**
	Investment Hubs (24)	111.6	7.0	0.0	27.9	**146.4**
	Total	**413.6**	**34.3**	**0.0**	**45.4**	**493.4**

	Panel B: Assuming a 20% profitability threshold and a EUR 750 million global revenue threshold					
		Jurisdiction of ultimate parent				
	(USD billion of 2016)	**High income**	**Middle income**	**Low income**	**Investment Hubs**	**Total**
Jurisdiction of affiliate	High income (64 jurisd.)	86.0	0.4	0.0	3.1	**89.5**
	Middle income (105)	7.6	5.8	0.0	1.4	**14.8**
	Low income (29)	0.0	0.0	0.0	0.0	**0.0**
	Investment Hubs (24)	55.6	3.4	0.0	10.9	**69.8**
	Total	**149.2**	**9.6**	**0.0**	**15.4**	**174.2**

Note: Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP. This 'top-down' residual profit matrix is computed by 'rescaling' the matrix in Table 2.9 to ensure that the total amount of residual profit in each column equals the total amount of residual profit as computed based on MNE consolidated accounts in component A. This matrix assumes illustratively a 10% (Panel A) or 20% (Panel B) profitability threshold (based on PBT to turnover) and a EUR 750 million global revenue threshold. It focuses on ADS and CFB.
Source: OECD Secretariat.

2.7.8. Resulting estimate of a jurisdiction's share of residual profit

143.   Ultimately, a jurisdiction's share in global residual profit, which corresponds to component E of the formula in Figure 2.1, is computed as the total of this jurisdiction's row in the final 'top-down' residual profit matrix (Table 2.10) divided by the total residual profit in this matrix.

144.   To reflect the uncertainty around the data used, as in the case of destination-based sales (component C), the results presented in the final section of this chapter integrate an uncertainty range around the share of residual profit in each jurisdiction (i.e. component E). The width of this range depends on the extent to which data in the profit matrix for the jurisdiction considered (as a jurisdiction of affiliate, i.e. in the row of the profit matrix corresponding to its jurisdiction) is based on 'hard' data on MNE profit (anonymised and aggregated CbCR or ORBIS data) vs. extrapolations based on macroeconomic data (e.g. FDI). For a jurisdiction where the profit matrix is based exclusively on hard data, the range for component E is constructed as ±10% around the point estimate. For a jurisdiction where the profit matrix is based exclusively on extrapolations, the range is ±20%. For jurisdictions with a mix of sources, the width of the range is in-between.[32]

2.8. Component F: Tax rate on double tax relief

145.   Once the amount of profit subject to double tax relief has been identified, the final step in the analysis is to assess the rate at which double tax relief would be provided, which relates to the rate at which relieved profit was taxed before the application of Pillar One. While this is an important component of the assessment, its modelling comes with significant uncertainty, due to data challenges related to the measurement of the effective tax rate (ETR) faced by MNEs across jurisdictions, and also because the tax rate on double tax relief will depend on considerations about Pillar One design and its interactions with other tax rules that will ultimately be decided by the Inclusive Framework.

146.   As a starting point, one could assume that double tax relief would take place at the statutory CIT rate of the jurisdiction providing double tax relief. This would correspond to a case where, before the application of Pillar One, an MNE was paying a tax rate on its profit that was computed based on the statutory CIT rate of the jurisdiction considered. This MNE may have benefitted from tax provisions related to its economic activity, such as accelerated depreciation rules or tax incentives for R&D, resulting in an ETR (as computed for example with financial account data) below the statutory rate. This situation could

still be consistent with providing double tax relief at the statutory CIT rate, to the extent that these other provisions would not interfere with Pillar One.

147.   However, it is also possible to envisage cases where the tax rate on double tax relief may be lower than the statutory rate. For example, this could happen in a case where MNE income benefits from a preferential tax rate lower than the statutory rate (e.g. patent box rate, special economic zone) under the assumption that double tax relief would be provided at this preferential rate. It could also correspond to a situation where double tax relief would be provided in the form of a tax credit (as opposed to a tax exemption) where a tax credit would be provided by the domestic jurisdiction against taxes paid in the market jurisdiction where residual profit is allocated. In this case, the tax rate on double tax relief could take place at a lower rate than the domestic CIT rate if the tax rate in the market jurisdiction is lower.

148.   To reflect this uncertainty, the results presented in the final section of this chapter assume that the tax rate on double tax relief falls within a range between a high estimate, which corresponds to the statutory CIT rate (using the same sources as in component D above), and a lower estimate. This lower estimate is set arbitrarily at five percentage points below the statutory CIT rate, except in the case of investment hubs where it is based on the minimum effective tax rate on MNE income observed across a range of sources (US BEA data on taxes paid and profit-type returns, data from Tørsløv et al. (2018[2]), and anonymised and aggregated CbCR data) also used in the analysis of Pillar Two (see Chapter 3 for more detail on these sources).

2.9. Overview of the results

149.   The estimated effect of Amount A of Pillar One on tax bases and tax revenues across jurisdictions has been computed by the OECD Secretariat based on the methodology presented in this chapter. As discussed in the Chapter 1, these jurisdiction-level results have been shared on a confidential and bilateral basis with most Inclusive Framework members. The OECD Secretariat has provided estimates to more than 115 jurisdictions at their request. Jurisdiction-specific results were shared in the form of revenue estimation 'tools'. These tools provide jurisdictions with the ability to consider the estimated impact on tax revenues in their jurisdiction of a range of potential Pillar One parameters (e.g. global revenue threshold, profitability threshold percentage, reallocation percentage and nexus threshold) and to distinguish the contribution of ADS and CFB activities to the estimated outcomes. Estimates in the tools are presented as ranges to reflect the data uncertainty.

150.   After extensive consultation with members of the Inclusive Framework, there was no consensus over whether or not jurisdiction-specific estimates should be publicly released as part of the economic impact assessment. In view of this lack of consensus, no jurisdiction-specific estimates are included in this chapter.

151.   This chapter presents results for jurisdiction groups, at a relatively high level of aggregation. Two groupings are considered:

- **By income levels**: Jurisdictions are distributed in four groups: (i) high, (ii) middle, and (iii) low income jurisdictions, based on a classification by the World Bank, and (iv) 'investment hubs', defined as jurisdictions having a ratio of inward FDI positions to GDP above 150%;

- **By statutory CIT rate**: Jurisdictions are distributed in four groups based on their statutory CIT rate in 2019: (i) below or equal to 10%, (ii) 10-20%, (iii) 20-30%, and (iv) above 30%.[33]

152.   Results are presented for an illustrative set of Pillar One parameters, including a EUR 750 million global revenue threshold, a profitability threshold percentage (based on PBT to turnover) of 10% or 20%, a reallocation percentage of 10%, 20% or 30%, a EUR 1 million revenue nexus threshold for ADS and a EUR 3 million revenue nexus threshold for CFB. Results are subject to the caveats listed in the first section of this chapter. They are presented as ranges to reflect the data uncertainty around the estimates. The

assumptions used to build these ranges are presented in the different relevant components of the analysis (i.e. location of MNE destination-based sales, estimated effect of revenue nexus threshold, location of MNE residual profit, tax rate on double tax relief).[34]
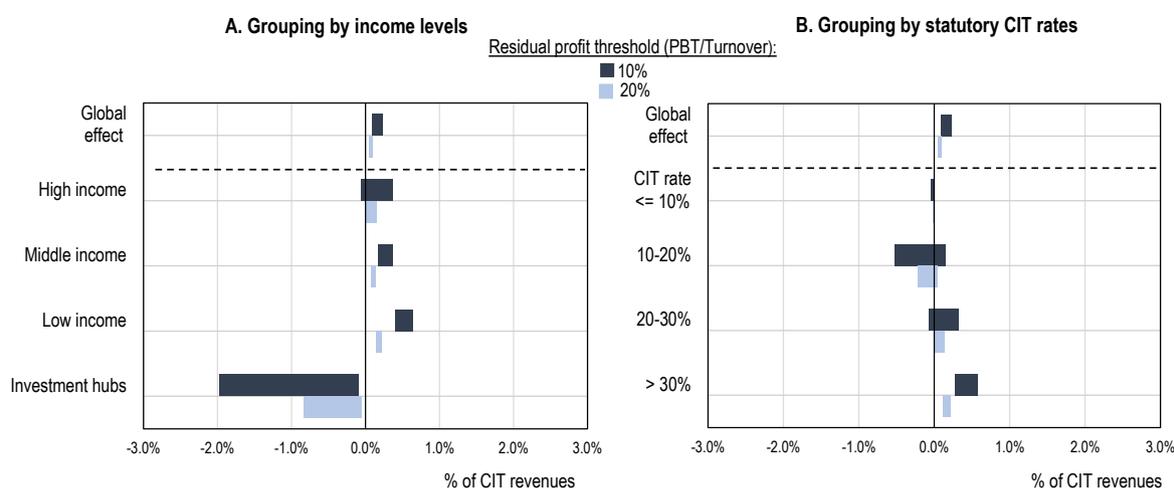
2.9.1. Effect of Pillar One on tax bases

153. The effect of Amount A of Pillar One on the global tax base equals zero. This is because Amount A reallocates tax base across jurisdictions without changing the global tax base. The jurisdiction groups benefitting most from this tax base reallocation (as a share of their GDP) are middle and low income jurisdictions, while tax base gains tend to be more modest among high income jurisdictions (see result Figures in Annex 2.C). In contrast, investment hubs would lose tax base in the reallocation, reflecting that a significant share of residual profit is currently located in investment hubs. Results by statutory CIT rate groups offer a consistent picture. Tax base gains are largest among jurisdictions with higher rates (20-30%, and even more above 30%), while jurisdictions with lower rates (10-20%, and even more 0-10%) tend to lose tax base.
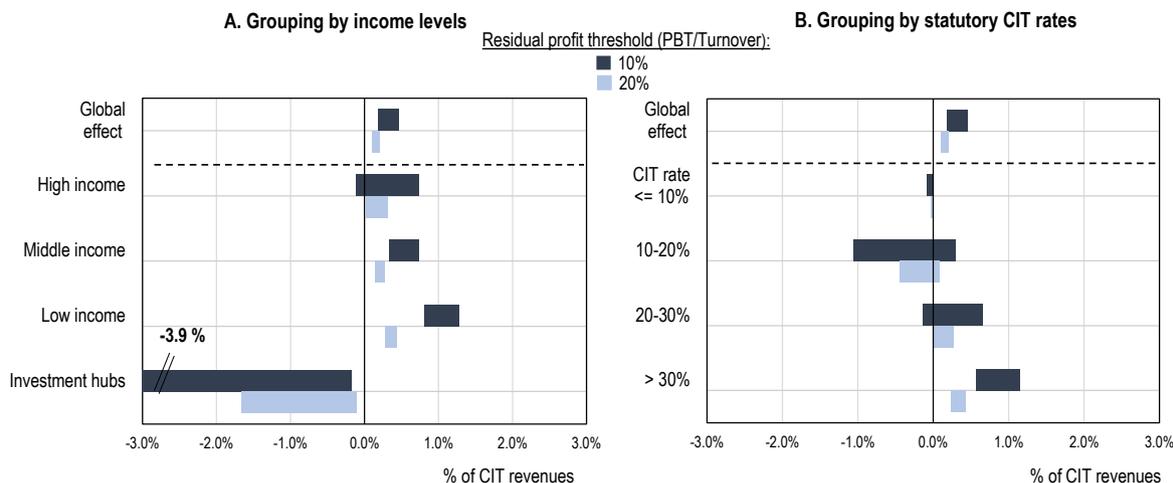
2.9.2. Effect of Pillar One on tax revenues

154. At the global level, Amount A of Pillar One involves a tax revenue gain (Figure 2.14). This is because, on average, tax base is reallocated from jurisdictions with relatively low tax rates towards jurisdictions with relatively higher tax rates. However, the magnitude of this global revenue gain is modest – less than 1% of global CIT revenues – across the set of assumptions underlying Figure 2.14. On average, high, middle and low income jurisdiction groups would all benefit from small tax revenue gains. Revenue gains tend to be larger (as a share of current CIT revenues) among low income jurisdictions, where little residual profit is currently located. Revenue gains also tend to be larger among jurisdictions with relatively high statutory CIT rates. In contrast, jurisdictions with statutory CIT rates below 10% and between 10% and 20% would lose revenue on average, the loss being relatively smaller in the former group (despite a greater loss of tax base in this group) since the low tax rate of jurisdictions in this group implies that they would have little double tax relief to provide (or even no double tax relief to provide for zero-tax jurisdictions).

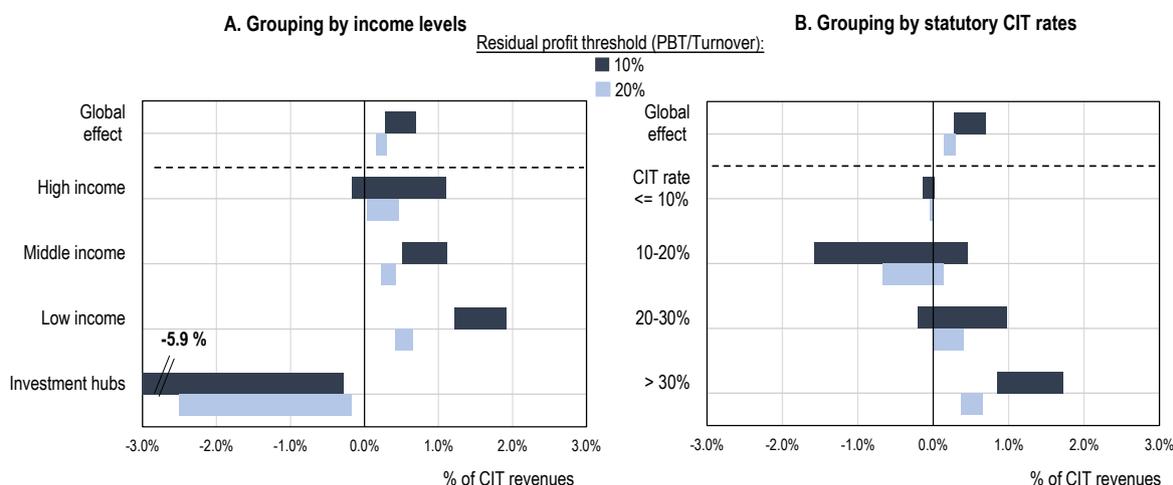### Figure 2.14. Estimated effect of Pillar One on tax revenues, by jurisdiction groups

Panel A: 10% reallocation to market

Panel B: 20% reallocation to market

A. Grouping by income levels

Residual profit threshold (PBT/Turnover):
■ 10%
■ 20%

B. Grouping by statutory CIT rates

Panel C: 30% reallocation to market

A. Grouping by income levels

Residual profit threshold (PBT/Turnover):
■ 10%
■ 20%

B. Grouping by statutory CIT rates

Note: All estimates are based on the methodology presented in this chapter and subject to the caveats listed in the first section of this chapter. Estimates are presented as ranges to reflect data uncertainty. The ranges measure the uncertainty around the estimate of each jurisdiction group, without necessarily implying that all jurisdictions in the group fall within the range. Results assume illustratively a EUR 750 million global revenue threshold, a profitability threshold (based on PBT to turnover) of 10% or 20%, a reallocation of 10% (Panel A), 20% (Panel B) or 30% (Panel C) of residual profit to market jurisdictions, a EUR 1 million nexus revenue threshold for ADS and a EUR 3 million nexus revenue threshold for CFB. Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP.
Source: OECD Secretariat.

2.10. Conclusion

155.   This chapter describes the methodology and data sources used by the OECD Secretariat to estimate the order of magnitude of potential tax revenue implications of Amount A of Pillar One, across a range of parameter options, and presents illustrative results for broad jurisdiction groups.

156.   The data underlying the analysis in this chapter inevitably predates the COVID-19 crisis, as well as other important developments such as the implementation of various measures under the OECD/G20 BEPS project and the introduction of the US Tax Cuts and Jobs Act (TCJA). Many key results in this chapter can be expected to remain valid in the post-COVID-19 environment (e.g. on the sensitivity of the outcomes to the various Pillar One parameter choices). However, the amount of global residual profit and

the exact magnitude of tax revenue effects are likely to be substantially affected by the crisis. In particular, as discussed in this chapter, it is likely that ADS becomes relatively more important in the future (as a share of the economy, and also as a share of the combined global residual profit in ADS and CFB) than suggested by the estimates in this chapter, reflecting the accelerated digitalisation of economies.

References

Bailin, A. et al. (2019), "Like it or not? The impact of online platforms on the productivity of service providers", *OECD Economics Department Working Papers*, No. 1548, OECD, http://dx.doi.org/10.1787/080a17ce-en. [13]

Bajgar, M. et al. (2019), "Industry Concentration in Europe and North America", *OECD Productivity Working Papers*, No. 19, OECD, https://www.oecd-ilibrary.org/economics/industry-concentration-in-europe-and-north-america_2ff98246-en. [6]

Blouin, J. and L. Robinson (2019), "Double Counting Accounting: How Much Profit of Multinational Enterprises Is Really in Tax Havens?", *SSRN Electronic Journal*, http://dx.doi.org/10.2139/ssrn.3491451. [11]

Cadestin, C. et al. (2018), "Multinational enterprises and global value chains: the OECD analytical AMNE database", *OECD Trade Policy Papers*, No. 211, OECD Publishing, Paris, https://dx.doi.org/10.1787/d9de288d-en. [9]

Clausing, K. (2020), "Profit Shifting Before and After the Tax Cuts and Jobs Act", *SSRN Electronic Journal*, http://dx.doi.org/10.2139/ssrn.3274827. [12]

Eurostat (2008), "NACE Rev. 2 - Statistical classification of economic activities in the European Community", *Eurostat Methodologies and Working papers*, Eurostat, Luxembourg, https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF. [8]

Gal, P. (2013), "Measuring Total Factor Productivity at the Firm Level using OECD-ORBIS", *OECD Economics Department Working Papers*, No. 1049, OECD Publishing, Paris, https://dx.doi.org/10.1787/5k46dsb25ls6-en. [4]

Hernández, H. et al. (2017), *The 2017 EU Industrial R&D Investment Scoreboard*, European Commission, https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/2017-eu-industrial-rd-investment-scoreboard. [3]

Johansson, Å. et al. (2017), "Tax planning by multinational firms: Firm-level evidence from a cross-country database", *OECD Economics Department Working Papers*, No. 1355, OECD Publishing, Paris, https://dx.doi.org/10.1787/9ea89b4d-en. [5]

OECD (2020), "Corporate Tax Statistics - Second Edition", OECD Publishing, https://www.oecd.org/tax/tax-policy/corporate-tax-statistics-second-edition.pdf. [10]

OECD (2020), *Tax Challenges Arising from Digitalisation – Report on Pillar One Blueprint: Inclusive Framework on BEPS*, OECD/G20 Base Erosion and Profit Shifting Project, OECD Publishing, Paris, https://dx.doi.org/10.1787/beba0634-en. [1]

Tørsløv, T., L. Wier and G. Zucman (2018), "The Missing Profits of Nations", *NBER Working Paper*, No. 24701, http://www.nber.org/papers/w24701.pdf. [2]

UNCTAD (2017), "The Top 100 Digital MNEs", in *World Investment Report 2017 - Investment and the Digital Economy*, https://unctad.org/en/PublicationChapters/wir2017ch4_Annex_en.pdf. [7]

Annex 2.A. Main steps of the construction of the MNE consolidated financial account dataset

157.   The dataset of MNE consolidated financial accounts relies primarily on data from ORBIS, provided by Bureau van Dijk (BvD). The ORBIS database is the largest cross-country database on ownership and financial accounts of firms worldwide. It relies on information from various underlying sources, including credit rating agencies (e.g. Cerved in Italy) and national banks (e.g. National Bank of Belgium). ORBIS contains data for both publicly listed and privately owned companies.

158.   Given that ORBIS data is not primarily collected for statistical analysis, important processing and cleaning work is required to enhance data reliability (e.g. eliminating duplicates and reporting errors). This concerns ownership data and financial data. The main data cleaning steps in each area build on OECD expertise with ORBIS and follow as much as possible procedures used in previous OECD studies, while adapting them when necessary to the needs of the current exercise. These main cleaning steps are detailed in the sections below.

159.   To ensure as exhaustive coverage as possible, ORBIS data are complemented with other firm-level data sources, namely Thomson Reuters Worldscope database, the EU Industrial R&D Investment Scoreboard, Fortune Global 500, as well as manual checks and additions from firms' annual reports.

ORBIS Ownership data

160.   The ORBIS historical ownership database contains extensive information on ownership links between firms, which can be used to identify entities belonging to the same corporate group. Following Bajgar et al. (2019[6]), entities in ORBIS are assigned to corporate groups based on their Global Ultimate Owner (GUO), using a 50% ownership threshold, and considering GUOs of corporate nature (i.e. Industrial companies, Banks, Financial companies, Insurance companies, or Financial companies) to avoid for example assigning to the same group two independent firms owned by the same individual or government entity.

161.   In turn, MNE groups are defined as corporate groups having entities in at least two jurisdictions. For each MNE group, only the consolidated account of the GUO is kept in the sample, to avoid potential double counting.

162.   The procedure to clean and extend ownership links in ORBIS has been implemented by the OECD Directorate for Science, Technology and Innovation, following Bajgar et al. (2019[6]) and updating it for year 2016. The procedure focuses on all entities with a turnover of at least EUR 10 million, and focuses on ownership links above a 50% threshold. Missing links are identified, or (in a smaller number of cases) existing links are corrected, using the following steps:

- Using the BvD Zephyr database on Mergers and Acquisitions (M&A) to identify changes in immediate (rather than global ultimate) owners not available from ORBIS.
- Using ORBIS historic ownership linkages to identify changes in immediate owners not available from ORBIS.
- Translating the changes in immediate owners (from the first two steps above) to changes in ultimate ownership.

- Imputing missing ownership information by using data on M&A or changes in ownership in earlier or later years.

- Correcting ultimate owners that are in fact majority owned by another firm, since by definition they cannot be an ultimate owner.

- Removing temporary (one or two year) changes in ultimate owner that reverse themselves – as such cases seem highly unlikely to occur in reality and probably reflect gaps in the ownership data.

- Detecting missing linkages for large firms that change from having no subsidiaries to having a large number of subsidiaries one year to the next.

- Identifying missing links for large firms that never have any subsidiaries, and for large groups of subsidiaries that never have a parent with financials.

- Using name-matching algorithms to identify potential links, in combination with detailed manual inspection (e.g. against firms' annual reports) to check if these potential links are correct or not.

- Manually checking the 300 largest firms, using the subsidiary structure in their financial statements to cross-check the ownership data.

163.   Overall, this procedure identified the GUO of about 50,000 entities for which it was not reported in the raw ORBIS data, and corrected the GUO of about 4,000 entities. Overall, these entities (added and corrected GUOs) represent about 4% of turnover in the final sample of consolidated MNE group accounts.

ORBIS Consolidated financial account data

164.   The sample of consolidated account data comprises only entities that are the GUO of their corporate group. The sample is restricted to MNE groups, i.e. corporate groups that have entities in at least two jurisdictions.

165.   In the raw ORBIS dataset, consolidated account data tend to be of better quality than unconsolidated data, reflecting that the financial amounts involved are larger on average, which tends to imply that they face stricter reporting and auditing requirements. Still, consolidated ORBIS data requires some cleaning to eliminate suspect values that could result from reporting errors.

166.   The procedure for cleaning consolidated account data comprises the following steps, inspired by the cleaning steps in Gal (2013[4]), Johansson et al. (2017[5]) and Bailin et al. (2019[13]) that are relevant for this exercise:

- Selecting full-year accounts with closing date around December 2016 (from July 2016 to June 2017);

- Filtering duplicate firm-year observations, favouring those with non-missing key financial variables and with closing date equal to or closest to 31st of December;

- Eliminating implausible values: negative assets or turnover, implausibly high profit or turnover;

- Dropping observations with implausible profit margin (e.g. pre-tax profit or EBIT on turnover either below -100% or above 100%);

- Manually dropping apparent remaining duplicates, i.e. firms with different BvD identifiers but relating to the same group.

Other firm-level data sources and manual checks

167.   While the coverage of ORBIS at the consolidated account level is very good (unlike at the unconsolidated level), it is not entirely exhaustive, especially in certain sectors (banks, insurance), which

are covered in separate ORBIS databases that do not contain all the variables of interest. In order to improve coverage, the database is complemented with firm-level data from other sources.

168.   The first complementary firm-level dataset used is Worldscope, edited by Thomson Reuters, which reports mandatory data for listed companies worldwide. The merger between ORBIS and Worldscope was done in two steps. The first step consisted of matching MNE GUOs in ORBIS with Worldscope data based on the International Securities Identification Number (ISIN) available in Worldscope, and keeping Worldscope financial information for the GUOs that had no financial information at the consolidated level in ORBIS. The second step consisted of considering the biggest Worldscope companies that could not be matched with any GUO in ORBIS based on the ISIN number and adding those that were actually MNEs and absent in the ORBIS database, based on manual checks.

169.   The database was furthermore complemented with data from the 2017 EU Industrial R&D Investment Scoreboard and the 2016 Fortune Global 500 list, following the same approach as for the second step of the Worldscope additions (manual checks). The EU Industrial R&D Investment Scoreboard, which also relies on BvD data, contains limited financial information on 2,500 companies with the highest R&D expenditure worldwide. The Fortune Global 500 list, issued by the Fortune magazine, contains financial information on the 500 largest corporations worldwide as measured by total revenue. A few large missing MNE groups were also added manually based on information from their annual report.

170.   Overall, data sources complementary to ORBIS and manual additions permitted the addition of 963 MNE groups to the dataset, representing nearly 20% of the turnover of the total sample.

171.   Detailed manual checks were performed on the final dataset, with a specific focus on the top-500 largest MNE groups (by turnover), the top-100 MNE groups with the highest levels of residual profit, the top-400 MNE groups with highest pre-tax profit classified in financial sectors (including activities of holding companies), the top-25 ADS MNE groups with the highest levels of residual profit, and the top-3 MNE groups with highest residual profit in each industry (30 industries, based on the NACE Rev. 2 classification).
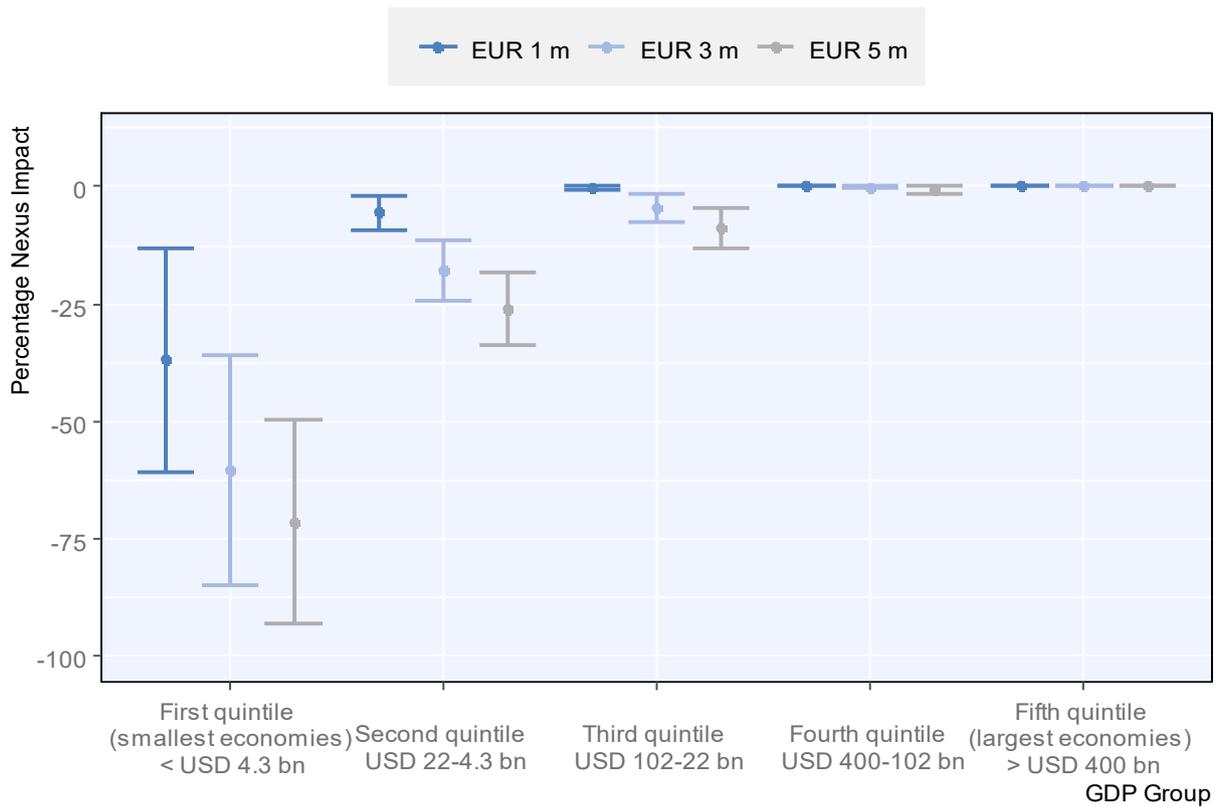
Annex 2.B. Revenue nexus threshold modelling: Robustness check

Annex Figure 2.B.1. Estimated effect of a revenue nexus threshold on allocated profit for alternative values of the lambda parameter

Revenue nexus thresholds of EUR 1m, 3m and 5m, compared to a no-threshold situation
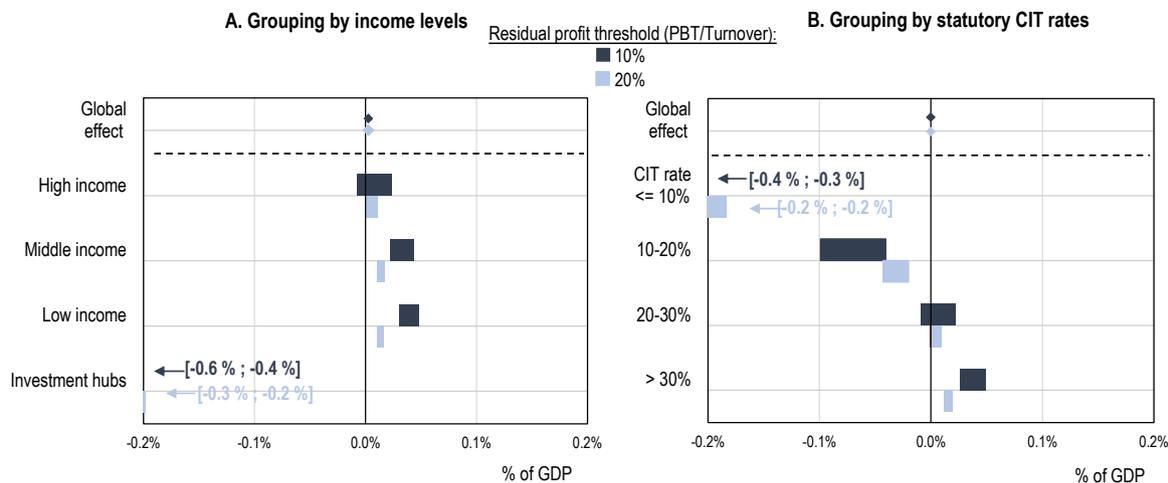
Panel A: Assuming lambda = 3
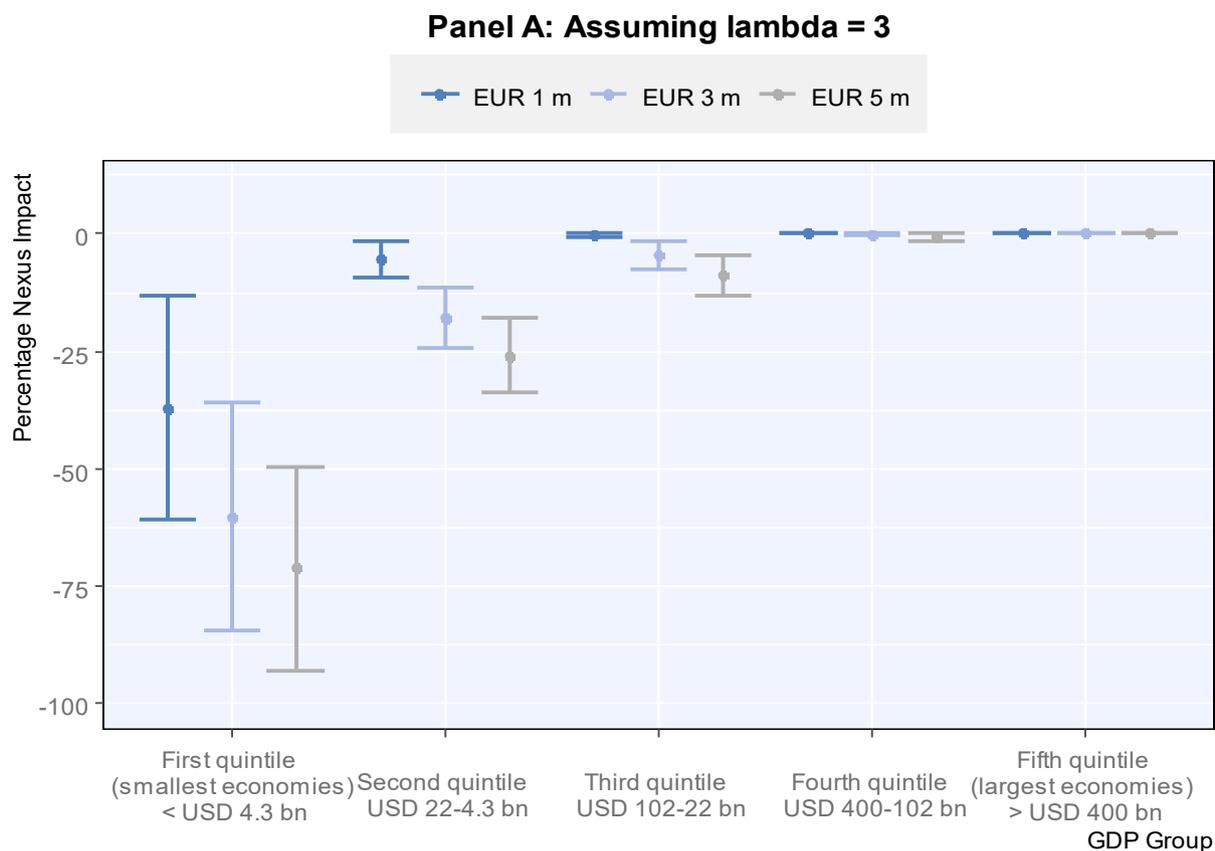
Panel B: Assuming lambda = 20

Note: These figures are alternative versions of Figure 2.10 for alternative values of the lambda parameter, which measures the propensity of MNEs to be more present in larger than smaller markets. Estimated differences are less than 1% on average for all jurisdiction groups and all nexus thresholds for values of lambda between 2 and 50. A value of 7 is used for lambda in the baseline estimate.
Source: OECD Secretariat.

Annex 2.C. Estimated effect of Pillar One on tax bases

Annex Figure 2.C.1. Estimated effect of Pillar One on tax bases, by jurisdiction groups

Panel A: 10% reallocation to market

Panel B: 20% reallocation to market

Panel C: 30% reallocation to market

A. Grouping by income levels   B. Grouping by statutory CIT rates

Residual profit threshold (PBT/Turnover):
■ 10%
■ 20%

Note: All estimates are based on the methodology presented in this chapter and subject to the caveats listed in the first section of this chapter. Estimates are presented as ranges to reflect data uncertainty. The ranges measure the uncertainty around the estimate of each jurisdiction group, without necessarily implying that all jurisdictions in the group fall within the range. Results assume illustratively a EUR 750 million global revenue threshold, a profitability threshold (based on PBT to turnover) of 10% or 20%, a reallocation of 10% (Panel A), 20% (Panel B) or 30% (Panel C) of residual profit to market jurisdictions, a EUR 1 million nexus revenue threshold for ADS and a EUR 3 million nexus revenue threshold for CFB. Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP.
Source: OECD Secretariat.

Annex 2.D. Robustness of results to alternative modelling of the location of ADS sales

172.   As discussed in section 2.5.3, identifying the location of ADS destination-based sales poses data challenges. This annex contains a robustness check to assess the sensitivity of Pillar One revenue estimates to the assumptions used in modelling the location of ADS sales. The baseline results presented in Figure 2.14 are compared to results obtained with:

(i)   An alternative distribution of ADS sales assuming lower sales in lower income jurisdictions. Compared to the baseline assumptions, ADS sales in low income jurisdictions are divided by 2, ADS sales in middle income jurisdictions are divided by 1.5 and ADS sales in high income jurisdictions are left unchanged. This alternative distribution can be interpreted as assuming that ADS represent a smaller share of the average consumption basket of internet users in lower income jurisdictions than in higher income jurisdictions. Ultimately, it is the *distribution* of global sales that is relevant for the revenue estimates in this chapter, and not the absolute *level* of sales.

(ii)   An alternative distribution of ADS sales computed with the same method and the same data as the distribution of CFB sales (described in section 2.5.2).

173.   Overall, results are not very sensitive to these different modelling assumptions.

Annex Figure 2.D.1. Estimated effect of Pillar One on tax revenues, by jurisdiction groups, for alternative modelling assumptions on the location of ADS sales
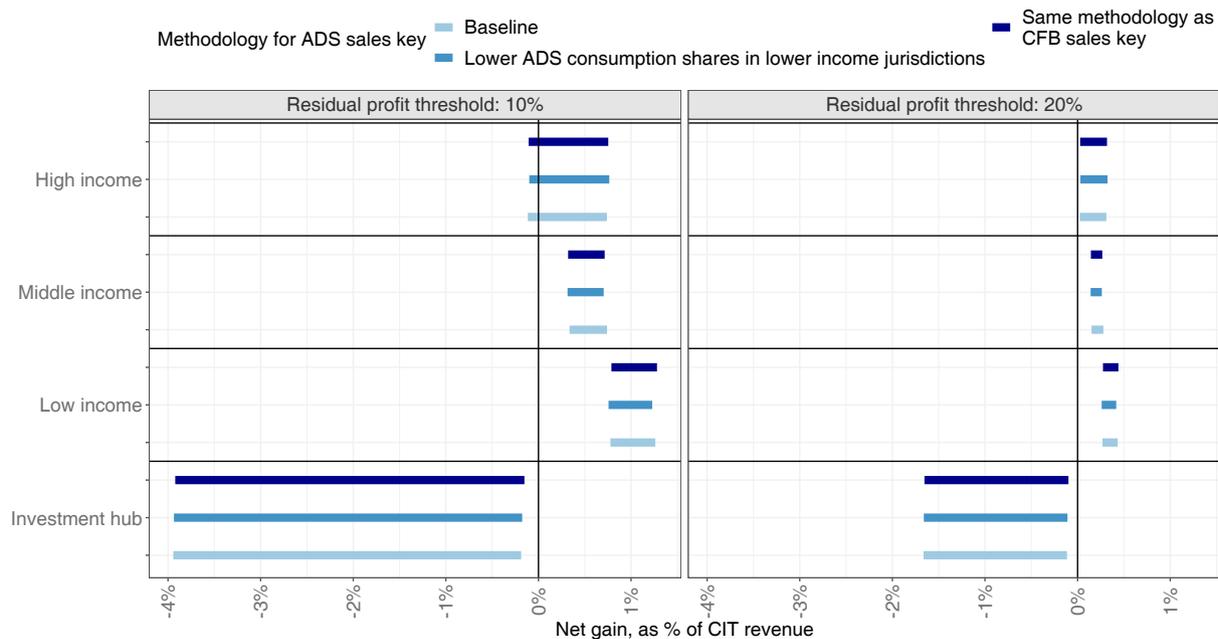
Note: This figure presents Pillar One revenue estimates by jurisdiction groups, illustrating the implications of using different assumptions to model the location of ADS sales. The baseline estimates in light blue correspond to those presented in Figure 2.14. The alternative estimates in darker shades of blue assume (i) that ADS represent a smaller share of the consumption basket of an internet user in lower income jurisdictions than in higher income jurisdictions, or (ii) computes ADS sales using the same methodology as the one used to estimate CFB sales. See section 2.5.3 for more details. Results assume illustratively a EUR 750 million global revenue threshold, a profitability threshold (based on the ratio of PBT to turnover) of 10%, a reallocation of 20% of residual profit to market jurisdictions, a EUR 1 million nexus threshold for ADS and a EUR 3 million nexus threshold for CFB. Groups of jurisdictions (high, middle and low income) are based on the World Bank classification. Investment hubs are defined as jurisdictions with a total inward FDI position above 150% of GDP.
Source: OECD Secretariat.

Notes

[1] The OECD/G20 BEPS Package was released in October 2015 and various measures outlined in the package have been implemented in the years that have followed. A range of measures agreed to be implemented by members of the Inclusive Framework continue to be implemented by jurisdictions and, therefore, the full effect of these measures is not captured in the data available at the time of this analysis.

[2] This implies that, contrary to some other approaches in the literature, but in line with the Pillar One Blueprint report, the possibility to define (and potentially reallocate) 'negative residual profit' is not considered in this chapter.

[3] Total turnover of MNE groups in ORBIS and production of MNEs in Analytical AMNE are not fully comparable for two reasons, having effects going in opposite directions and broadly cancelling each other out: (i) turnover in Analytical AMNE includes intra-group transactions (which represent about a quarter of total MNE transactions according to aggregated CbCR data), while they are netted out in ORBIS consolidated account data; (ii) Analytical AMNE data focus on production, which is about a quarter smaller than turnover (the trade sector is where the difference is largest).

[4] For example, the 'IT software and services' category in the UNCTAD classification contains both producers of automated 'on-demand' software, which have been considered as ADS in the analysis in this chapter, and producers of more customised software involving heavier human intervention, which have been assumed to be out of scope. The main software producers have been classified manually to make this distinction. Another example is the NACE Rev. 2 category for the "activities of holding company", which contains some MNE groups with economic activities in different sectors. These MNE groups have been reclassified manually to the category corresponding to their economic activity.

[5] This estimate is based on MNE groups with financial data available in ORBIS for all the years from 2013 to 2016, with a global turnover above EUR 750 million in 2016, and with primary activities in all sectors excluding finance and insurance.

[6] The global MNE sales used in the denominator include sales of all MNE groups in scope, including MNE groups that do not sell in the jurisdiction considered, for consistency with component A, which focuses on the residual profit of all MNE groups in scope.

[7] Data from the BEA annual survey of the foreign activity of US multinationals are available on the BEA website (https://www.bea.gov/international/di1usdop). The yearly data includes specific statistics on majority-owned affiliates, which are the ones of interest here. In particular, several tables in Table II.E provide information on the industrial and geographical breakdown of goods and services supplied by US affiliates abroad. Table II.E.2 shows goods and services supplied by affiliates with a breakdown by jurisdiction. In 2015, foreign affiliates of US MNEs supplied USD 3.3 trillion of goods and services to their host countries including USD 3.1 trillion to unaffiliated entities.

[8] Using unpublished data underlying the OECD Analytical AMNE database, it is possible to subtract intermediate consumption sourced from (domestic or foreign-owned) MNE entities located in the same jurisdiction as the MNE entities considered. This corrects the issue posed by within-country intra-group sales (i.e. the arrow equal to 5 in Figure 2.3) but with the downside that within-country intermediate consumption from third-party entities is also subtracted, while it should not be.

[9] Entities are defined in the same way in Analytical AMNE as in the National Accounts, which means among other things that permanent establishments are treated in the same way as subsidiaries. Therefore, MNE sales going through a permanent establishment are counted at their destination in the proxy measure of destination-based sales.

[10] The classification in Table 2.2, Panel B implies that certain industries in Analytical AMNE contain subcategories that are CFB and others subcategories that are either ADS or out of scope. In this case, the sector has been included in proportion to the share of its activities that are CFB, based on data at the 4-digit level from the ORBIS database. For example, if a sector A contains two subcategories A1 (CFB) and A2 (out of scope), ORBIS consolidated account data is used to assess the relative importance of A1 and A2 in A, based on the global turnover of MNE groups in A1 and A2 (e.g. 70% in A1 and 30% in A2). Finally, the sector A is included in the computation of the proxy measure of destination-based sales in proportion to its share that is CFB (70% in this example), i.e. instead of adding to the proxy measure its turnover minus its exports, the approach is to add only 70% of its turnover minus 70% of its exports.

[11] This imputation is different from the imputation made in the online version of the Analytical AMNE database, which does not focus specifically on destination-based sales and therefore uses imputations based on another methodology, which is less relevant for the purpose of the present analysis.

[12] Ultimately, five jurisdictions (Hong Kong (China), India, Iceland, Morocco, and Romania) are deemed outliers in this regression, based on the Cook's distance – a statistical measure for outliers. For these five

jurisdictions, sales are based on the regression prediction rather than the imputation described above. These jurisdictions are also subsequently excluded from the final version of the extrapolation regression.

[13] Remittances received (https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT) and paid (https://data.worldbank.org/indicator/BM.TRF.PWKR.CD.DT) consist of World Bank estimates based on balance of payments data from the IMF. Foreign aid is taken from the OECD Net Official Development Assistance database (https://data.oecd.org/oda/net-oda.htm).

[14] An analysis of more disaggregated data (not presented in this chapter) also suggests that the sectoral composition of MNE destination-based sales appears not to vary widely across jurisdictions. This may reflect the fact that sectoral specialisation is less pronounced in consumption patterns than in production patterns. While certain jurisdictions specialise in the production of certain goods or services, all jurisdictions generally consume a wide range of goods and services. Even the goods and services that are produced within a jurisdiction rather than imported (e.g. due to specialisation in production) may be produced by MNE entities and therefore included in MNE destination-based sales.

[15] Data on household consumption per capita is taken from the United Nations Statistics Division which provides consistent estimates of various national accounts aggregates in USD with a broad geographical coverage. Data on the share of internet users from the International Telecommunication Union was accessed through the World Bank data portal (https://databank.worldbank.org/reports.aspx?source=2&series=IT.NET.USER.ZS&country=) which shows the number of individuals who have used the internet in the last 3 months before the survey.

[16] The extrapolation regression of household consumption expenditure on GDP per capita presents outlying values for 9 jurisdictions (Brunei Darussalam, Kiribati, Macau (China), Nauru, Qatar, Sierra Leone, Turkmenistan, Venezuela, and Yemen), which have been identified based on a high Cook's distance. This suggests potential noise in the underlying data in these jurisdictions. To address this issue, the extrapolated values based on GDP-per-capita (which are likely to be generally less noisy) have been used for these jurisdictions.

[17] It is the distribution (rather than the level) of sales that matters in the estimation of Pillar One revenue effects in this chapter, and those assumptions should therefore be considered in terms of how they affect the distribution of sales rather than their level.

[18] A potential refinement to the approach would be to vary the λ coefficient according to MNE size, reflecting that the propensity to focus only on larger markets is likely to be higher among smaller MNEs than among larger ones.

[19] For some very small jurisdictions this approach leads to very few MNEs being assigned presence, so a minimum probability of presence is assumed for very small jurisdictions so that there are always some MNEs present in each jurisdiction. In the baseline simulation, a minimum of 50 CFB MNEs and 15 ADS MNEs are assumed present.

[20] Using the share of jurisdiction j in global (ADS or CFB) sales is a conservative assumption, since the MNE considered may not have sales in all jurisdictions. A less conservative assumption would be to use the share of jurisdiction j in total (ADS or CFB) sales across the jurisdictions where the MNE is assumed to have sales.

[21] The number of simulations (200) is set sufficiently high to ensure that results would look similar if an even higher number of simulations were applied.

[22] Implicitly, this amounts to assuming that if residual profit is allocated to a jurisdiction where an MNE group is in a loss position, this MNE group is not allowed to offset residual profit against this loss.

[23] In contrast, consolidation effects can lead the "top-down" measure to be higher than the "bottom-up" one. This is the case if the denominator of the profitability ratio considered (e.g. turnover) includes intra-group transactions. For example, an MNE group may have a high profit-to-turnover ratio at the consolidated level (where intra-group transactions are consolidated and therefore not included in turnover), but relatively low profit-to-turnover ratios at the entity level, where turnover includes intra-group transactions.

[24] In practice, the residual profit matrix draws on a range of data sources, as further discussed below, including anonymised and aggregated CbCR data, which applies by construction a EUR 750m global revenue threshold, and other sources (e.g. ORBIS) where no such threshold is applied. This issue is discussed further in Chapter 5.

[25] UNCTAD produces a merchandise trade matrix which provides data on merchandise exports by country of origin, trading partner, and product group based on the Standard International Trade Classification.

[26] ORBIS unconsolidated account data has been cleaned and checked extensively, building on the OECD expertise from several earlier projects. The cleaning steps follow those applied to consolidated account data (described in Annex 2.A) but also include additional steps specific to unconsolidated level data (see details in Chapter 5)

[27] Ideally, it would be preferable to consolidate rather than sum the profit and turnover of entities from the same MNE group (i.e. to net out internal transactions) but this is not possible with the available data from ORBIS.

[28] Only fuels and metals are considered for this adjustment since the analysis of consolidated financial accounts of MNEs suggests that total residual profit in agriculture is very low compared to the fuels and metals sectors.

[29] The BEA data is taken from Table II.F.3 of the US Activities of US MNEs data. The 'information' sector in the BEA data regroups the following subcategories: publishing industries; motion picture and sound recording industries; broadcasting and telecommunications; data processing, hosting, and related services; other information services.

[30] This situation is more likely to occur for relatively high profitability thresholds than for lower thresholds. This explains why the "rescaling" is reducing the global amount of residual profit relatively more when assuming a 20% threshold than a 10% threshold (see Table 2.9 and Table 2.10).

[31] Ideally, the impact of revenue thresholds should also be taken into account in the computing of the 'bottom-up' residual profit matrix. However, limitations of the data underlying the profit and turnover matrices make this impossible to do.

[32] More precisely, the range is constructed as $\pm[10\%+s*10\%]$, with the variable 's' being the total residual profit that is based on extrapolations in the row of the residual profit matrix corresponding to the jurisdiction considered, divided by the total residual profit (extrapolated or not) in that row. Residual profit is considered to be based on extrapolations in cells of the residual profit matrix where the profit matrix upon which it builds is filled with extrapolations rather than with aggregated CbCR or ORBIS data.

[33] Jurisdictions with a CIT rate of exactly 20% are included in the second group (10-20%) and 30% in the third group (20-30%).

[34] The assumptions presented in the different sections of the chapter focus on building ranges for individual jurisdiction results. Ranges for jurisdiction groups are built with consistent assumptions by treating the group as a (fictitious) single jurisdiction. For example, for CFB sales in component C (i.e. CFB MNE sales into a jurisdiction, as a share of global CFB MNE sales), the methodology is to build a range of ±10% around the point estimate for a jurisdiction when the estimate is based on hard data, and ±20% when it is based on extrapolations. For a group of jurisdictions, the range would be ±[10%+s*10%] around the point estimate (which would be the total MNE sales into the group of jurisdiction, as a share of global MNE sales), with s representing the share of MNE sales that are based on extrapolation in the jurisdiction group considered.

From:

Tax Challenges Arising from Digitalisation – Economic Impact Assessment
Inclusive Framework on BEPS

Access the complete publication at:
https://doi.org/10.1787/0e3cc2d4-en